

BASIC PRINCIPLES IN EDUCATION

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HOUGHTON MIFFLIN COMPANY

BOSTON • NEW YORK • CHICAGO • DALLAS • ATLANTA • SAN FRANCISCO

The Riverside Press Cambridge

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The Riverside Press

CAMBRIDGE • MASSACHUSETTS

PRINTED IN THE U.S.A.

PREFACE

For a good many years, in attempting to study the fundamentals of our art, first with schoolmasters and teachers in practice and then with university students in education, I have chiefly been struck by their desire to be told "how to do it" and by their reluctance to believe that recipes cannot be written so that he who runs may read and running quickly, and with minimum effort, arrive at pedagogical efficiency. Parallel to this impatience of school workers themselves seems to be the impatience of people who introduce themselves as "practical" men and women and call for "something that our teachers can carry out," quite regardless of the issue whether their teachers are competent to carry out anything at all. Far from the possibility of any such cut-and-dried conception of instructional processes is the principle that from day to day, from pupil to pupil, from district to district, the problem varies and must constantly be restated and solved anew. In other words, teaching, the management of pupil personnel, the organization of schools, are continuous problem-solving enterprises and the heart of the matter is the need of a system of educational thinking. Any such system is of necessity based upon a valid understanding of what education itself is.

We have had a good many systems of education so called. For the most part, they have been rather systems of pedagogy or else systems of ethics. Not infrequently a body of psychological doctrine has been accepted as a theory of education. All this seems to me to have been getting the cart before the horse, or, to vary the metaphor,

to have been setting forth on a voyage equipped with the instruments of navigation, but with neither destination nor a chart.

Theories of education since Greek times have so tended to be merely scholiums in speculative philosophy that scientific men have often been skeptical about the whole matter and have been inclined to leave one's theory of education an open question in which one opinion is as good as another.

No longer need this be true. In the last hundred years, progress in the study of life upon our planet, of Man and Man's place in Nature, of the human organism, of society and the structure of society, has been so considerable that, as it seems to me, we have the material for formulating a theory of education, defensible on grounds of scientific principle. In the present volume I have attempted to do that. In a subsequent volume I hope to extend the inquiry on the same general lines so as to extract, from what we know of education and society and civilization, a defensible theory of the curriculum of general education and of the school system as a civil institution.

It seems necessary to point out that this is not a work on teaching, but rather on what lies behind teaching.

HENRY C. MORRISON

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CHAPTER I

CHANCE AND SYSTEM

PROGRESS in instructional practice is singularly handicapped by the circumstance that most people have had some measure of schooling and in numerous instances are the holders of college degrees.

The paradox is explained by the principle that, human nature being what it is, people tend to think that whatever they studied must of necessity be right and whatever teachers they had must have possessed the divine afflatus. It must be so; else how can one account for himself?

For a long time we older schoolmasters were told at every turn that we "ought to teach Colburn's arithmetic" or perhaps the Webster speller. So far as the first of the two was concerned, there was some truth in the declaration, but unhappily the book was in some respects obsolete and at any rate it was out of print. "That's why the boys and girls of today don't know no arithmetic and can't spell or use the language right. You don't teach 'em right. Now when *I* went to school ——" but the schoolmaster usually escaped at about that point. A more cultivated person, perhaps a lawyer or editor or professor, or even on occasion a President of the United States, would tell us that we ought to teach everybody the classics, or more mathematics, or be more thorough in English. And then would follow the reason, which nine times out of ten would be, "Now, when I attended the —— High School, old So-and-So did this with us."

Sometimes we encountered the superlative individual who had been bred at an English Public School or German Gymnasium or French Lycée, and then were we dumb indeed.

More often, perhaps, people would complain at what was being done in school on the ground that they had done much the same thing. Their complaints would run after this fashion, "If I had only had better schooling, I might have been ——" Tragic thoughts these! The first kind of people had been successful in life, or thought they had been; therefore their schools were right. The second kind had been unsuccessful, or at least were lacking in confidence; therefore their schools were wrong. These are they who read omnivorously all that is written about the New Education, whatever that may be.

The trouble with all these people is that they are empiricists and not rationalists. They have a background of experience, but no explanation of experience.

But the schoolmaster himself was not much better, and probably in most cases still is not. He had no set of convictions as to the why and wherefore of his doings, or, if he had, his convictions were as likely as not false. He could follow tradition and later on could give tests, but as to any chart and compass that would tell him his destination and the way, he had none and was often unaware of the need of any.

On the other hand, serious scientific study of educational processes has frequently exhibited the same underlying lack. The student diligently collects facts, refines them by elaborate scientific technique, and ends by proving some obscure point which has little or no relation to other points. Centuries might easily be required for the evolution of any real science of education under that

procedure. We must wait for some improbable genius to appear who could manage the sorting out of these car-loads of theses and monographs and surveys to see what they all mean. It is much the same as if a voyager were to set forth on the ocean and spend his time collecting samples of surface fauna and flora, making analyses of sea water, perhaps taking soundings and so on. He might spend a lifetime, provided he could feed and clothe himself and his ship's company, in collecting a monumental mass of interesting material, but he would reach no port save by chance. On the other hand, if he were to set forth on a voyage which had been intelligently planned, he would probably arrive at some intended port sooner or later. On subsequent voyages, he might well find his soundings useful and, for all I know, his other studies as well. At any rate, he would know what studies were likely to throw light on the art of navigation.

I

SYSTEMS OF PRACTICE

The truth of the matter is that all the great scientific technologies start life as more or less systematic arts, and progress results: (1) from the solution of the problems encountered in practice; and (2) from the readiness within which discoveries in other fields are related to the interpretation of practice.¹ Certain illustrations will serve to make clear the point.

In medicine. There were physicians and surgeons long ages before there was such a thing as scientific medicine. The Egyptian tombs, for instance, and perhaps even some prehistoric skulls, disclose evidence that what would to-

¹ See for instance the most interesting account contained in Sigerist, *Man and Medicine*.

day be called major operations were performed, no doubt with some degree of success, else they would not have attained the relative excellence that is manifested in the remains.

But practice grew into system, so that we find mentioned Hippocratic medicine and Galenic medicine for instance; and since voyages were thus charted over the sea of the cure of human ailments, it was the most natural thing in the world to observe, put two and two together, and make some progress not only in medicine proper but in the underlying sciences of anatomy and physiology. Unhappily, empirical systems get stereotyped and thus tend to slow down advantageous changes in practice, long after such changes have become possible. Nevertheless, even that is better than chaos in the beginning and chaos in the end. One can readily imagine that all the libraries in the world might easily have become stored with the ancient and mediæval equivalents of doctors' theses in physiology, to no good technological purpose whatever, apart from the circumstance that there was always medical practice at hand to give them meaning in terms of the cure of human ills. From Hippocrates to Osler, medical science and the underlying sciences as well have advanced in terms of systems of medicine: first, systems of practice and then, in the end, systems of theory or principle.

In engineering. Similarly with engineering. There were planners and builders in very ancient times. In other words, there were engineers. It is a commonly accepted tradition, and the tradition is probably the truth, that geometry grew up to meet the needs of land surveyors and irrigation engineers in the Nile Valley, and doubtless elsewhere under similar conditions. Be that as it may,

engineers laid out highways, erected bridges, built aqueducts and irrigation works long before there was any science of engineering in any of the various modern fields. And their work stood up. There was a practice and system of engineering ready to select, give meaning to, and utilize applicable scientific principles as fast as the latter were discovered, even down to our own time. More important than that, there came in due time to be a system in terms of which critical problems could be stated. Thus, the modern industrial research laboratory is the intellectual descendant of the engineers in the Nile Valley who "wondered how it could be done," and very possibly of their professional kindred in the pueblos of ancient Arizona.

In instruction. And so it is with us schoolmasters. Whether we realize it or not, our craft is exercised and our problems are stated chiefly in terms of the system of the Jesuit secondary schools of the seventeenth century, with their emphasis on pupil performance, memoriter work, eruditional attainments, and especially their appeal to cupidity and emulation. Every time we hear a lesson, record a grade, publish class standing, award a prize, or confer a degree, we are doing exactly what the old Jesuit teachers would do if they could be lifted out of their century and set down in ours. More than that, every time we devise a standardized test, and most times when we carry through a pedagogical experiment, we are trying to learn how better to carry into effect the system of the Jesuits, who after all were supremely good schoolmasters whatever we may think of their theory of education. Even so, it is far better that we should consistently follow that system than to lapse into the intellectual chaos of no system at all. The latter has very frequently been

the case when teachers in the elementary school have attempted to apply the much more defensible theories of Pestalozzi, apart from adequate understanding of them expressed as schoolroom practice.

II

EMPIRICISM AND RATIONALISM

Now the technological professions founded on system almost from the beginning, or at least from the point at which they emerged from magic and mysticism, were *empiric*, down to the period at which there had accumulated a sufficient body of scientific knowledge for them to become *rational*. Nor does a sufficient body of science in itself operate to create a scientific profession. As we have seen, the libraries of the world might be bursting with treatises in elaboration of valid scientific truth and yet without avail, so far as professional practice is concerned. Scientific practice does not emerge until there appears some pregnant generalization or group of generalizations on which a *system of thinking* can be founded. At that point, a system of practice becomes converted into a system of thinking. Men always think, according to their capacity it is true, but there is all the difference in the world between naïve and systematic thinking.

Empirical and rational procedures defined and contrasted. Empirical thinking is thinking based on experience as distinguished from thinking "spun out of the inner consciousness." Writers often extol empirical procedure and remark, for instance, that such and such a finding is truly empirical in character. They mean that it is not a mere unsupported statement, that its proponent has some factual reason for thinking as he does.

Rationalistic thinking, on the other hand, seeks to find

out why the facts are what they are, why the experience was what it was, and thus to discover principles of universal validity.

One is thinking empirically when, after an untoward experience, he says to himself, "Well, I'll never do that again; I shall get into trouble if I do." He is thinking rationally when he tells himself beforehand, "That sort of thing is in violation of principle; therefore I will not do it." Perhaps he had learned from experience and then rationalized his experience. So in general the world requires both forms of thinking. The real heart of the matter is that in the first instance the empirical thinker and actor might repeat the action a thousand times without mischance, since he cannot know empirically whether or not his first misfortune in reality had anything to do with his act.

The old texts in logic loved to go to extremes in their illustrations — after this fashion.

Primitive man had no experience of anything else than the orderly succession of day and night. To him as to us "As surely as the sun shall rise tomorrow ——" was the last word in the expression of certitude. Empirically, he had good assurance, but actually he did not know that the sun would ever rise again. Once in a lifetime, perhaps, a total eclipse frightened him out of his wits. When astronomers reached the point at which they could correctly explain why we have the succession of day and night, experience was rationalized.

Since it has been fair weather since last Monday, I may empirically conclude that it will be fair tomorrow, but I shall not bank anything on the event, for I have also empirically been disappointed more than once. But I may consult the weather map, ascertain why we have

this delightful day, note continental weather conditions prevailing, and conclude that it will be fair tomorrow, unless unpredictable meteorological changes occur. In that case I am thinking rationally

Pragmatism

Crude pragmatism in actual current practice is concluding that anything that works is right or true, and the converse. Now genuine philosophical pragmatism is not far removed from the evolutionary way of looking at life and society, and that is the real basis of most of our study in the present work, but there is a wide gap between considering the fruits of long ages of natural and social experimentation and seeing why and how things in general have come to be what they are, and concluding that whatever seems to work today and this year is either right or ought to work. We find such crude pragmatism in a great deal of current pedagogical experimentation. This is a particularly mischievous example of sheer empiricism. It by no means follows that what works is right, or even that what does not work is wrong. There is no vestige of good scientific reasoning here until we have defined the objectives of the teaching accurately, and further, have explained on rational grounds why what works does work and why what does not work does not. If this is done, we may easily find that failure to work is explained not by the non-validity of the hypothesis being tested, but rather by unrelated circumstance.

Thousands visit various faith cures and many of them are indubitably cured. The inference is drawn that there must be miraculous virtue present. That is crude pragmatic empiricism. Analysis of the process at work discloses the fact that the outcome is merely a well-known

mental phenomenon. Thus, the occurrence is rationalized and the important disclosure is that the cure will work only for certain maladies and under certain conditions.

Hoskins, in *Tides of Life*, describes the primitive practice of rubbing a colloid goiter with iodine. It worked. Therefore what was needed was application of a liniment to the swelling and iodine was the right liniment. Pragmatic empiricism. Under the rational conclusions of pathologists, iodine is seen to have worked because the system required it in the elaboration of the thyroid secretion. It works just as well wherever it can be so applied as to be taken into the system.

In our school experience, we frequently find tests in universal acceptance and from them we derive certain inferences, because the results satisfy certain conditions which we set up, for instance that the test shall give us a good estimate of probable success in school. That is good empirical thinking. The procedure is rationalized when we are able to explain by a process of reasoning that is logically coherent why the test is a valid prognostic instrument. Even so, the situation is not fully rationalized until we have shown that success in school is success in educational progress. Until that is done, the situation is still much like that presented by the faith cure, less crude, perhaps, but still of the same order.

Now all this is not to deprecate factual foundations for any kind of thinking. We rest all scientific thinking ultimately on observed facts, partly because that is the only way in which we can make contact with reality, either external or internal, and partly because we are bound otherwise to be deluded by our own fancies. But compared with the insights into principle which discernment of the relationships of facts enables us to make,

facts treated merely as experience are of little use in science, even when they lead to inference.

Experimenting

Empirical procedure must not be confused with experimental procedure. An experiment is a situation set up for the purpose of determining whether the new facts which are disclosed are what they ought to be, our theory or hypothesis or understanding being what it is. For example, suppose we have formed a notion as to what are the causes which interfere with the learning of a pupil. The notion is pure fancy unless it will explain facts which have been observed in the pupil's behavior. If we had assurance that we possessed all the facts, an experimental verification of our notion would add nothing. Unhappily, however, we are never sure that we have all the facts and, therefore, we are never sure that our theory in reality covers the facts. Hence, we proceed with the treatment that is logically implied by our theory. If the treatment works and the inhibition is removed, we conclude that we have experimental verification of our theory, since the new facts are what they ought to be in the light of our hypothesis. But observe that from beginning to end the validity of our reasoning is paramount and the observed facts only secondary, albeit they are essential to the process.

Thus the experiment is nearly the last word in rationalization.

It is perhaps worth the while to linger for a bit on this notion of experimentation and ask ourselves, What is legitimately an experimental school?

For perhaps a generation past there has been a veritable furor for "science." Discerning men have found it hard

to believe that there is any reason why the inductive method in investigation checked by experimentation, which has accomplished so much in the division of the physical sciences during the past four centuries, should not be equally serviceable in the field of the social sciences, including education. Doubtless they have been right. Year by year, accordingly, scientific people have lifted their voices at teachers' conventions and wielded their pens in popular periodicals calling their hearers and readers to "experiment!" "experiment!" Their words have reached the minds of many people, the great majority of whom had not the faintest idea of what an experiment is, save that it is something new, and the newer the better.

Hence there have appeared numerous institutions heralding themselves as "experimental schools." Most of them have been and are mere adventures, and so some of them, in all honesty perhaps, style themselves. A good empirical venture, however, is backed both by a definite purpose and an intelligent surmise. We wonder if the thing will not do what we think it will, and so we try it. Thus Penrod and his friend Sam, in Mr. Tarkington's inimitable story of boy life, mix up a dreadful brew of discarded family medicines and flavoring extracts, with the intention of perpetrating practical jokes. The trouble is they are not at all sure of the physiological effects. So they require Duke to take some. *Fiat experimentum in corpore vili*, or, as we say in English, "Try it on the dog." Now that is good experimental procedure, so long as laboratory animals hold out, but it is widely different from trying something new without any hypothesis whatever. It would have been distinctly boylike if they had given Duke some "just to see what would

happen," without Maurice Levy in the picture at all. That would have been an adventure.

An experimental school is rightly named when pedagogical proposals based on ascertained fact and established principle are tried out, with the purpose in mind, not of establishing the validity of the proposals, but of working out a basis in classroom procedure calculated to achieve the purpose. True enough, the experimenter may in the course of his experimentation uncover facts which force him either to modify his original proposals or else abandon them altogether.

Now, pedagogical experimentation is in effect materially different from experimental procedure in the laboratory of pure science. In the latter, the purpose is to establish a principle; in the former to work out a procedure. Laboratory investigation of necessity precedes pedagogical investigation. Medical analogies are nearly always available. A great deal of progress has resulted from clinical experimentation which is of the same order as good pedagogical experimentation; but a physician might well be deprived of his license if he ventured to use a patient for the purpose of solving experimentally a problem in physiology.

And so experimental schools are misnamed when their purpose really is to provide opportunities for psychological experimentation. That is a laboratory function.

In professional evolution

Perhaps it will be worth while to glance briefly at the two learned professions which we have used in illustration in their evolution from empirical callings to scientific technologies. Doing so may help us to understand what instruction must become before it, too, can properly be

termed a scientific technology, or art founded on principle.

Medicine. In medicine, there were long centuries of empiricism, extending even down to our own time, before practice became in the full sense scientific. On the other hand, surgery was a craft rather than a profession, down to the period when the underlying medical sciences had evolved to the point at which they were capable of explaining to the craftsman the reasons for his success as well as for his failures.

Medical treatment in the empirical stage was founded on what we have called empirical venture rather than experiment. That is to say, physicians pondered over their cases and wondered in the light of experience whether this or that might not work. Sometimes it did; more often it did not. More often still, probably, they were deceived by their pragmatism and what worked in one case would not work in another, or else the patient would get well in spite of treatment. Nevertheless, they now and then hit on an expedient which was founded on principle, although they had no means of knowing it. An example of the latter is the use of Peruvian bark or quinine in malaria. Somebody tried it and it worked and then became what was known as a specific, but nobody knew why it worked until the plasmodium which is the cause of malaria was discovered, its life history made out, and the effect of the drug upon it. In due time, many of these specifics were added to the equipment of the practitioner, to say nothing of multitudes of prescriptions which are horrible to contemplate.

Now this is not to say that the physicians of other days were not actuated by the scientific spirit. Many of them were, for they were always trying to find out things about

the body, and any man who honestly tries "to find out why" is actuated by the scientific spirit. And they found out a good deal, too. Curiously enough, some of the most recent discoveries in scientific medicine suggest that even the Greek physicians, who professed what look today like weird ideas, were at least on the right track. The trouble is that the empiricists found out much more that "wasn't so." They lacked instruments, and the experimental method, and for centuries they were handicapped by prejudice against dissecting the human body.

Nevertheless, beginning perhaps with Vesalius in the Renaissance, real scientific progress in human anatomy and physiology began to be made and progress once inaugurated began to accumulate, for real learning always tends to breed learning. Even down to the present, medical men were escaping out of empiricism so far as understanding of the body and its functions could help them to do so.

But practice does not make its final escape into a rational procedure until some critical generalization or generalizations are made which throw light, not on the material with which the profession has to deal, but on the ends which it aspires to achieve. During the nineteenth century two grand disclosures in biology appeared. One of these was the cellular structure of tissue, the other was the behavior of micro-organisms in their hosts and especially what they do to their hosts. Add to these a third, and somewhat later disclosure, namely, the integrative function of the nervous system and of the endocrine organs.

Now these were not primarily medical discoveries; but, as we have seen, so long as there is a system in being, significant discoveries in any field tend quickly to get

appropriated and assimilated. The effect was the one thing needed, a comprehensive rational theory not of bodily functions but of disease, the entity with which the physician deals.

The analogy in instruction is again a rational and defensible theory of education, the entity with which the schoolmaster has to deal.

Engineering. The evolution of engineering as a scientific profession, while different in details from that of medicine, is much the same in effect.

The South American Indian who hangs a bridge across a gorge accomplishes an engineering feat, albeit he is totally unaware of scientific principles. He can have no rational ground of confidence that his bridge will stand; and yet he has confidence, for he and others have built that kind of bridge before and their works have on the whole been abiding. The facts are good, but they are only empirical facts. The primitive engineer can keep on building such bridges and now and then make an improvement. He does not know why his bridges do their work, however. Therefore he cannot sit down in his hut, solve a new problem in bridge building, and give workers their working plans and specifications, in confidence that if the latter are duly carried out the strange new bridge must stand and do its work.

And so it goes all through pre-history and the greater part of the history of the civilized world. Remarkable structures are planned and executed purely on an empirical basis, some of them so vast that we wonder still how they were done. Now and then a permanently useful principle appears such as the principle of the arch, the flying buttress and the like. But it takes a long time.

Now it seems like a far cry from hanging a crude

suspension bridge over a mountain gorge to hanging a dome so flat as that of Saint Sophia, but intellectually speaking the difference is one of degree and not of kind. When modern engineers design and erect a great office building, their achievement is intellectually a different kind of achievement.

Like the medical men, engineers stood ready to utilize any sort of scientific discovery that threw light on their work; and in that respect they were more fortunate than the physicians, for after all elementary principles in the inorganic world and in mathematics are much more obvious than elementary principles in the field of living matter. Simple geometry must have been a great help in laying out highways and military works. Elementary hydrostatics and mechanics came to be understood and engineers appropriated the principles disclosed. In due season, it was noticed — empirically — that the expansion of water vapor might advantageously be utilized, and a new era in industry as well as engineering was ushered in.

As in the case of medicine, in due time generalizations appeared which enabled engineers to *analyze their problems* as well as to understand their processes.

Of these, I suppose the most important have been the following:

1. Mathematical advances, notably in the higher geometry and calculus, enabled engineers to analyze motion and to state, for instance, the position in space at a given instant of a spot on a whirling crank.

2. Newton's equation of motion, $f = ma$, of which Professor Millikan says, "Not a single dynamical machine in existence today can be designed without its aid, not a steam engine, not an automobile, not a dynamo, not a motor, not an aeroplane, not a machine or device of any

sort for the transformation of work or for the utilization of power.”¹

3. The laws of electro-magnetism and of thermodynamics.

4. The restatement of the laws of chemistry.

In its empirical period, engineering progress rested its case on the inventor. In its present rational or scientific period, it rests its case on the research laboratory. Being able to *state its problems in scientific form* is a good deal more than half the battle.

.III

ANALYSIS OF PROBLEMS

And so we have seen that the professions which attain the status of truly scientific technologies typically must begin as empirical systems of practice, that they follow the exceedingly wasteful course of appropriating here and there bits of scientific knowledge, until the time comes when their problems can be rationally analyzed and stated. Thereafter the process is reversed and their research undertakings tend to go more definitely to the solution of specific problems, with minimum reliance on chance.

In instruction

The various processes which go on in the school and school system, ranging from school organization and administration to classroom teaching are still largely in the empirical period.

The school system. The organization of the school system is strikingly empirical and so are the changes in organization which are going on.

¹ *Evolution in Science and Religion*. Yale University Press, 38.

We shall have to defer until a much later point in our study a detailed account of the school system as it is, as it has come to be, and as it is undergoing changes. Suffice it to point out that in its main structure of elementary school, high school, and college, it is a curious mixture of structural elements derived from at least three different sources. In brief, different schools were originally imported and set to work because as empirical ventures they seemed to work. In due season, attempts were made to relate the different members of the system — again empirical ventures, and this time ventures which did not work. We are now going through another period of venturing with junior high schools and junior colleges and university reorganization, somewhat confused, however, by a recrudescence of mysticism in our theory of education.

Nevertheless, this is no counsel of iconoclasm. Far better a system founded on sheer empiricism than chaos, even though the empirical product is long outworn. Furthermore, just as in medicine and engineering empirical ventures frequently disclosed processes which were in actuality rationally defensible, so has the evolution of our school system. An instance, as I think, is to be found in the primary school. Another, I venture to predict, will be found in the current process of reorganization in which the junior high school and junior college are the ventures.

No, the trouble lies not in the empirical character of the system — that is far better than no system at all — but rather in the circumstance that, having no fundamental statement of our technological problem, we have no means of knowing *wherein and under what conditions* the system is right.

School administration. Again, the whole great body of paraphernalia in school management and administration

is very largely empirical in character. The numerous devices work in so far as they are a help in achieving the ends set up, but they are no assurance that the ends themselves are right. The consequence is that school administration tends to degenerate into mere office practice. There can be no validly scientific administration until the administration knows what it is that requires to be managed. Furthermore, the empirical requirements of administration constitute a powerful incentive to empiricism in educational psychology, for if administrative necessity requires some means of handling pupils *en masse* the educational psychologist is prone to forget his science, which is investigation of the learning process, and furnish the administrator with innumerable clever devices for handling pupils, all of which are well enough, provided one is willing to ignore entirely the implications of education itself or to act on sheer uncritical assumption.

Now the management and administration of schools of necessity operates in three somewhat distinct fields.

First of all is instructional administration. Herein the management is obliged to think out the whole great problem of the guidance and conservation of pupils in the presence of the learning process, the oversight of teaching and the supply of instructional material. But it cannot analyze and state its problems at all, save in the presence of a valid theory of education and in the presence as well of a valid psychology of the learning process; any more than the physician can state his problem save in the light of an understanding of the nature of disease and of the fundamental organs and processes of the body.

In the second place, the public school system especially is managed and administered as a function of the State. To ignore this whole critical relationship is gradually to

build up a system which is out of relationship to the institution from which its support and sanctions are derived and to which it is bound to contribute vitality. The consistently empirical attitude is to cultivate politics and rest the case on what will "get by" this year.

Thirdly, land must be bought, buildings erected and paid for, and salaries met. Thus the school system comes inexorably into the domain of the economic structure of society. Every dollar spent, every commitment incurred, has economic consequences which can no more be avoided than a man can avoid drowning if he stays under water long enough. Empirical administration here consists in stopping at the stage of keeping books and doing financial census work. The problem of administration cannot be stated save in terms of the underlying economics of the school system. Let me illustrate.

For a long time a moot point has been the relative economy of one-room as compared with consolidated rural schools. A scientific era is discontented with appeals to the rationale of the situation and demands facts. And so facts are gathered in seeming abundance. Costs in a county which has been consolidated are compared with costs in a county which has not been. Such variables as length of term, preparation of teachers, tenure of teachers and the like are equated, and conclusions are drawn. Sometimes the conclusions run one way and sometimes in the opposite direction. Now, in any such comparison, the facts prove only that in the counties compared one system did cost more than the other for that year or series of years or the reverse. The facts are more likely to seem to prove that there is not much difference. Even if in a hundred such comparisons the conclusions were all one way, they would prove nothing; thus far we should

have no assurance that in the next hundred pairs, or even in this hundred in another year, the opposite would not be shown.

But if now the investigator should endeavor to find out why the facts in favor of consolidation, the *positive side of the argument*, are what they are, he might very likely discover that he is in the presence of the economic principle of distribution of overhead and that, other things being equal, the consolidated school must in the long run be the more economical method of management. He would now be in a position to do critical administrative thinking. The factual studies did not represent fundamental thinking; they only represented getting ready to think.

The illustration drawn from economics gives us an instance of the age-old process of appropriating in practice principles which have been worked out in other scientific fields. In the field of instructional administration proper the schoolmaster must develop his own principles of inquiry as to why his instructional facts are what they are. Perhaps as we go on with our study we shall uncover some of the instructional principles.

The curriculum. The curriculum is perhaps as good an illustration of empirical development as can be found in the history of either medicine or engineering. If we begin with what today would be called "the curriculum of higher education" in the ancient and mediæval *trivium* and *quadrivium* and trace the content down to modern times, we find a tolerably consistent history of good empirical thinking. That is to say, under the assumption that education and erudition are synonymous, the inclusion of the arts and sciences, as knowledge expanded, was the obvious procedure. No serious challenge was presented until (1) the scope of knowledge became too vast

to be included in any curriculum and (2) social changes were sending people into the schools whose forebears had given little thought to any education at all. Until these two factors became operative, the contest between humanists and scientists could go on until the inevitable empirical equilibrium was reached in a "draw." Nevertheless, nobody had a defensible theory of the curriculum, because nobody had a rational theory of education. In brief, the curriculum problem could not be stated.

Teaching. It is the field of teaching, as it seems to me, in which we have made the longest steps away from the almost sheer empiricism which still characterizes the study of the school system, of management and administration, and of the curriculum. That is to say, we are gathering a scientific foundation which at least throws a good deal of light on the learning process. Such advance we owe almost entirely to laboratory studies in psychology. Thus, we are approaching the stage in which physicians had come to possess a rational basis in physiology, but for the most part not the stage in which they had acquired a rational theory of disease. In other words, there is gradually being built up a rational methodology.

In other days, no physician who had a competent understanding of the physiology of circulation and respiration would ever have bled General Washington for pneumonia, even though he never had dreamed of pneumococcus. He would have known why he should not do so, even though all the family had insisted. Similarly, the modern primary teacher will not use the A B C method in teaching reading, unless compelled to do so by an ignorant management, because she knows children will actually learn by that route only by chance, and she knows why.

The history of changes in method in teaching reading, and language in general, is an interesting illustration of some of the fundamental contentions of this chapter touching intellectual progress in the professions.

Fifty years ago, and probably more, teachers who were possessed of rare powers of observation were doing all in this field that the best modern teachers are doing. Through sheer pedagogical insight based on observation, and indeed justified by their results, they had reached the conclusion which has since been sanctioned by psychological investigation of the perceptual process in reading. That is to say, they had come to see that pupils learn a language most economically by practice with thought-wholes. It was what physicians would call a clinical discovery. It was empirical thinking at its best, but there was as yet no rational foundation. For all these teachers knew to the contrary, what they were doing might have been success in doing something quite different from teaching reading as such. It might conceivably have been mischievous. But the eye-movement studies showed clearly that reading is not a process of attending to isolated details of discourse. Thus pedagogy was in this instance justified by psychology.

On the other hand, the psychologist could not infer method from his findings any more than could the academic physiologist infer treatment, and, so far as I know, none of the psychologists did so. Thus we see illustrated the principle that scientific studies, at least those of the laboratory type, make but slow contributions to practice, unless there is in existence a system of practice to which they can be assimilated.

IV

The title of this chapter is Chance and System.

The long story of the evolution of the professions is a story of progress from chance to system, from the time when the issue whether the patient recovers or the bridge stands or the pupil gets civilized is on the lap of the gods, to the time when the issue is determinate and our knowledge is sufficient to control and direct the factors at work. Even so, the event is not *assured* for we have but little control over either organic material or the catastrophic forces of Nature. Nevertheless, in the end we are not satisfied until we can give a rational explanation of the reasons for failure, if failure there must be.

In the beginning, with medicine and instruction at least, practice seems to be a process of magical rites and mystical initiations. So is it in other fields in which practice deals with organisms, agriculture for instance.

Nevertheless, there grows up a craft and craftsmanship, and the practitioners, as the generations roll by, learn to see more clearly, the ends for which they are working. That is, tangible theories of medicine, engineering, agriculture, or what not, emerge. Theory is prone to be mystical, but even that is perhaps better than nothing at all, for it at least keeps curiosity alive. Practice sometimes works and sometimes does not.

However, practitioners learn to observe and infer from observed facts; they become empirical and exhibit less and less confidence in magic and mystery. An empirical profession grows up, sometimes eager, and sometimes reluctant, to assimilate true scientific discoveries. I suppose that it is impossible for us to realize how much we owe to the reluctance of level-headed practitioners who refused to admit the applicability of real or pseudo-

scientific discoveries to the requirements of practice. And no doubt the world was constantly losing in the stubbornness of others who were reluctant to mend their ways. Be that as it may, the term "learned profession" arose, and that in itself is testimony to the principle that practitioners were expected to "keep posted."

Nevertheless, an empirical procedure, however valid it may be as such, never eliminates the factor of chance. The factor may be very greatly reduced, it is true, compared with what it was in pre-professional stages, but it is always present, since the empiricist can never be sure of his ground. The building stands under ordinary conditions, and extraordinary conditions are dismissed as catastrophe because they are not understood. In most cases the building is needlessly and wastefully strong for ordinary conditions and useless in extraordinary conditions, because conditions are not rationalized and interpreted in terms of purpose, structure, and strength of material.

True it is that the rationalist cannot always be sure, but that is because none of us is perfect. The essence of empiricism, however, is to find the facts and draw conclusions. The empiricist's method is pragmatic and his conclusions seldom inspire him to look for more facts and very possibly discrepancies in his facts. The chance factor is in principle still large. The inclination of the rationalist, on the other hand, is to find not only his facts but the meaning of his facts. The outcome is established principle and not merely the conclusion, "Anyway, it works." The end of that road is fundamental scientific theory of practice and the negation of chance. As we have seen, it is ability to state and analyze the fundamental problems of the profession, Hence a learned profession,

in the modern, scientific sense, is not primarily a system of practice but primarily a system of thinking.

And so in the great matter of the instruction of each new generation, we can give our minds to the organization of the school system, to management and administration, to the shaping of the curriculum, to teaching — and we shall have learned but little unless and until we have mastered a valid theory of education itself founded on demonstrated scientific principle.

To this task we devote our attention in the present volume.

CHAPTER II

TERMS AND SOURCES

1

IT is impossible to think accurately and coherently, unless we have the appropriate language forms, or some other concrete symbols such as those which mathematics employs, in which to do our thinking. Scientific or systematic thinking further requires words which are always used in exactly the same meaning. In our ordinary converse with each other, intonation, facial expression, gesture with the hands or other parts of the body, convey our meaning, perhaps quite as much as do the vocal organs. In skillful narrative or descriptive writing, the author makes his discourse graphic, in part by the illusions which he knows how to create for the purpose of making word pictures. Not so in scientific speech. The scientist cannot convey his meaning with the aid of a lifted eyebrow, nor can he fall back on word painting. And so it comes to pass that every science rests heavily on its terminology, or the system it employs for the sake of achieving not only unmistakable meaning but also convenience in discourse itself. We commonly say, and with truth, that the measure of an exact science is the extent to which it can employ mathematics, the most exact of all languages. Nor should the principle be overlooked that scientific language is as truly essential when the thinker is communing with himself as when he is conversing with his scientific kindred.

The physical and biological sciences use a terminology founded on Greek, and the law, for a somewhat different

reason, one founded on Latin. Among several advantages thus accruing are: first, that professors and practitioners can converse internationally with greater ease; and, second, that Greek and Latin being now for the most part dead languages, which nevertheless were once the vehicles of highly civilized literatures, are less susceptible to changes in meaning than is the case in a living language like English.

Now the whole field which is commonly called education is singularly uncertain in the words which are used. Words which are of critical importance are not only used in no exact meaning, but their meaning varies in accordance with the whim of the user. That is perhaps one reason which accounts for the fact that practices are extremely amateurish. The word "education" itself, for instance, is used to mean almost anything, varying from what is a more or less legitimate use to the word for a political campaign or for advertising a brand of cigarette. Even when the word is used in its narrower sense of relation to the enterprises of schools and colleges it is still employed in a range of meanings so broad as to lead to confusion.

And so at the outset we need to set up a working terminology to suit our fundamental meanings. Whether or not the meanings in which we use words are in commonly accepted professional use need not concern us. There is no such use. Nor can we expect the general public to give up its customary use and meaning, nor need it. What is required is that people who try to study educational processes and institutions should use their terms in exact and consistent senses. Throughout our present study at least, we shall always be using our critical words *in the same sense and meaning*, and that the meaning developed

in the list of terms which are discussed in the present chapter. We shall, no doubt, add others as we need them in later chapters, but the present list is fundamental to our whole study. Furthermore, the meanings which are here elaborated constitute the statement of our thesis, that is to say, what we expect to show.

Nor are the meanings which are thus set up merely the arbitrary choice of the author. They are rather those which he thinks ought to be employed, as determined, sometimes by the etymology of the word itself, sometimes by the meaning which careful writers on scientific subjects use when they are obliged by their context to discriminate, and sometimes by the manifest nature of a process.

EDUCATION

From the time the egg is fertilized and begins to develop, the most characteristic and fundamental thing about a human being is change, change for better or worse in the direction of adjustment to forces which impinge on the individual. Since we sense these changes as being in general a matter of some kind of enlargement, we commonly refer to them as growth. We are further aware of two kinds of growth, physical development and more or less development in character or personality. We know that physical growth is dependent upon certain physiological processes, upon a food supply, and upon sundry environmental influences, such as those of climate. We know further that the other kind of growth is dependent upon what the individual learns. Hence, we may say that an individual can be defined at any period of his life as what he has come to be, first, by process of physical growth; and, second, by process of learning.

Education then is development in the individual by process of learning as distinguished from physical growth. That is the meaning which we shall consistently attach to the word "education" and its cognates throughout this volume. It may be that others would prefer to continue to use the word for something else. Whether that be true or not, the process itself is in fact what parents and the school are of necessity most concerned about; it is the means by which civilization is transmitted from one generation to another. We prefer to call it "education" and to refuse to attach any other meaning to the term.

And so the education of an individual may be good or bad. It may be normal, or abnormal, or arrested; much as in physical growth, starting with an entirely healthy infant, the outcome may be a normal and healthy individual, or one who is deformed in some way and unhealthy, or even one who does not grow at all.

If we were to study the educational history of an individual, as we sometimes do in remedial work, and write it up, we should in reality be writing the foundations of his biography. When Mr. Adams wrote his autobiography and called it the *Education of Henry Adams*, he used the term "education" in exactly the sense which seems to be the fundamental and correct sense.

When we speak of "educating" a child or young person, we are misusing the language and thereby confusing our thinking, unless we are using the word in the same sense in which the gardener uses "grow" when he speaks of growing vegetables or flowers or fruits. What he means is that he is "raising" or "cultivating" or "breeding" or "producing" them, depending somewhat on his purposes. The dictionary may sanction "to educate" as a transitive verb, but such is not good critical use. The

appropriate expressions are "instructing" or "teaching" or "nurturing" or, in common parlance, "bringing up." And so the word "educator" is a similar misuse or uncritical use. It is often rather a cheap and tawdry use as well. The correct word is "teacher" or "schoolmaster." It is not even "professor," for a professor is one who professes and pursues an academic subject. True enough, he may also teach, and when we have that in mind we call him a college or university teacher.

Similarly, when people speak of an "educated man" they commonly have in mind one who has passed through school and college. There is hardly any misuse which leads to such really disastrous confusion as does this, the most common of all. Let us see.

As I am writing these pages, there comes to my notice the dilemma of a young woman who is confronted with the perplexing task of choosing between two suitors. She describes one of them as being a college graduate and the descendant of a long line of college graduates. He is brilliant and "intellectual." He appears well in polite society. But he is selfish, "temperamental," given to outbursts of rage, and as yet has made no effort to establish himself in the world. The other is honest, unselfish, self-controlled, capable, *but* his "education" stopped at the end of the first year in high school. Happily, the girl's adviser, being a wise woman, does not hesitate an instant.

Now this young woman has in reality described one man whose education has gone utterly awry and another in whom education has been sound and normal, albeit in some respects, and these the less important, it is perhaps far from complete. She is confused because she feels obliged to take education into account and has no clear

idea of what education is. In that case, she follows a well-known mental process and stereotypes her thinking, that is to say, she substitutes a device for the thing the device is supposed to forward, in this case a career in school and college for the qualities which such a career is supposed to generate.

It is sometimes said that education is as long as life, and so it is. The conclusion which we must draw from all that scientific inquiry has gleaned concerning the nature of the human being is that this adaptive process which we call education begins very soon after the baby is born into the world and continues for better or worse until actual senescence sets in. But this conception creates a dilemma in the minds of people who insist on identifying education with a school career. Common sense convinces them that something akin to what they suppose to be education goes on out of school and after school, but going to school is "getting an education." But this person has been to school, "must have an education," and yet he is obviously not educated. It is enough to drive one mad. Mental confusion due to foggy thinking and foggy thinking due to lack of critical terms.

It is perhaps well to turn to some cognate and also to some contrasting terms.

General and liberal education

The first of these is a term which is frequently met, sometimes as "general education" and sometimes as "liberal education."

Now we need to recognize the distinctions between learnings which are essential to all men and women, and those further learnings through which individuals grow into the capacity of rendering special services in society.

Hence, we use the term "general education" to signify that growth, the need of which is common to all mankind, even though but few attain it.

"Liberal education" is an obsolete term for the reason that the kind of society to which it belonged is obsolete. It meant the course of instruction which free men might follow and it was related to the liberal arts, pursuit of which was at one time, in theory at least, restricted to free men. In a derived use, in the nineteenth century, it frequently implied "the education of a gentleman," which by an interesting survival usually meant moderation in the field of effort. Gentlemen were not supposed to work. The "gentleman's grade" was C.

In another sense all true education is liberal, in that it leads to the kind of personality which knows what to do instead of having to be told what to do.

Professional education

We sometimes hear it said of a workman, "He is a real mechanic," or other kind of craftsman. We mean that the individual in question has the personal qualities which enable him to turn readily to the skillful interpretation and solution of the problems of his craft and with devotion to high-grade workmanship. Whenever that is true, the essence of education is present; he has become that kind of man. For such, "craft education" is an entirely appropriate term. We have very little of it left, for few modern industrial processes are capable of that kind of relationship between the individual and his work. They call for "trade training," but not for craft education.

The distinguishing marks of a profession are, first, in the principle that its practitioner has come into independent command of its underlying arts and sciences;

and, second, in that he has become the kind of person who can apply them with honor and intelligence.

Thus we might well turn about and say that any calling is either a craft or a profession when its pursuit is of such a nature that individuals can grow into it by process of education. Otherwise it is either a trade or else merely casual labor.

Training

We speak of "trained" horses or dogs. Experimental psychologists "train" laboratory animals to go through various performances. In common use, there is little ground for confusion here. True enough, people sometimes speak of "educated" horses and other animals, but when they do they commonly do so with full understanding that their hearers or readers understand that they are speaking metaphorically.

In general, *training* takes place when humans are told what to do and when they and lower animals are habituated through practice in certain desirable acts, or even attitudes.

Thus, as we have seen, most preparation for carrying on industrial processes is of necessity training and not education.

Life is of course full of situations for which all have to submit to training, either self-training or training administered by somebody else, but such is no direct contribution to educational growth. Students of the educative process all through the modern period have recognized the distinction, and they have sometimes been so impressed with its importance that they have carried their theories of instruction to absurd lengths. Conversely, many of the older schools, both in America and Europe, were so un-

aware of the distinction that they ministered to little or no education at all. Cramming, which all intelligent and honest teachers recognize as instructional malpractice outright, is essentially training.

Advertising and propagandizing

It sometimes happens that merchants skillfully organize a campaign intended to induce the public to purchase their wares. The effect is desirable, at least to them, or else they would not do it. They cannot compel; therefore, they induce, largely by reliance on the mental process known as "suggestion." Such campaigns are often called campaigns of education. No harm in that. But when that meaning gets over into critical use, confusion and misdirection of effort result. Much that goes on in school is in reality advertising and not instruction. Illustrations are plentiful in the custom of holding "weeks" for this, that and the other.

Propaganda are really ideas to be propagated. Propagandizing might be defined as advertising applied to the spread of social or political ideas. The schools are constantly being used for propagandist purposes, only we do not characterize the practice in that way save when it is somebody's else ideas which are being propagated. Instances are instruction in the harmful effects of alcohol and narcotics, the humane treatment of the lower animals, and many others. Now some propaganda are useful and the schools represent a proper channel, some are vicious and most, probably, are neither the one nor the other. But whether good, bad, or indifferent they seldom contribute to education. Instruction is one thing; propagandizing is another. Whenever propagandizing has useful elements, such for example as the two instances noted,

they merely call attention to items which ought to be provided for in the regular program of instruction. The moment such elements are sorted out and made prominent, they become propaganda.

Enlightenment

If in addition to the suggestive devices which he uses, the advertiser in reality presents an argument calculated to convince his public rationally, then he contributes to public enlightenment. I should suppose that such would be good advertising, but it does not thereby become education. A great deal of the so-called "visual education" movement is at its best enlightenment and at its worst mere entertainment. Combined with other suitable methods of instruction, it may undoubtedly lead to right educational development; but, even so, enlightenment is no more education than food is growth. Indeed, while enlightenment is the basis of a great deal of sound instruction leading to right education, enlightenment at the wrong time may produce actual personal abnormality.

Special education

Arrangements for schooling the deaf, dumb, blind and other defectives are sometimes referred to as "special education." It is easy to see that the expression is misleading and therefore confusing. Education for these unfortunates is the same as education for their normal contemporaries. Instructional processes differ greatly and needs must. Sometimes defect is so deep-seated that education is impossible, or at best the possible extent of education is limited.

So we see what we shall mean when we use the word "education." Wherein growth consists, what are its pro-

cesses, what learnings must be acquired constitute the subject matter of this whole volume. Our further studies will go to justify our definition.

LEARNING

The next term in the use of which we shall need clarity and consistency is learning.

In common use, the word has almost as many meanings as "education." The pupil "learns his lesson," "learns" the names of the Presidents and of the state capitals, "can tell you just what happened in the Revolution," "knows all about chemistry," is "learning to be a man," is "learning a trade," and so on. Here is an assortment of meanings that will serve as illustrations.

Nobody ever learns a lesson, save in a metaphorical sense. Conceivably, the pupil may learn something from a lesson. He "cons" his lesson or memorizes it in some form in preparation for giving it back to the teacher.

Similarly, he memorizes the names of the Presidents or of the capitals of the States, so that these are subject to recall.

"Can tell just what happened in the Revolution," or "knows all about chemistry" — assuming that these startling claims are true — should be read to mean that he is "well-informed," at least in these respects.

"Is learning to be a man" is correct use, for it probably means that the boy is going through the changes which lead to maturity.

"Is learning a trade" is right enough when it means that the individual is becoming a craftsman.

In a certain city a prize was offered for excellence in citizenship and following an examination which was conceived to be suitable the prize was duly awarded. A

short time afterward, the prize winner was convicted of stealing. Faith in human nature must have been sadly shaken in some of the devotees of citizenship training. Doubtless some of them fell back on mysticism and alleged "bad stock" and "inherited instinct" as the explanation. A century or two ago, "total depravity" or "invincible ignorance" would have been trotted out in the quest for intellectual equilibrium, or in other words an explanation.

Now, truth to tell, the boy had probably acquired a good deal of information about citizenship, but he had not thereby become a citizen, at least to the extent of discriminating between mine and thine. Other boys had become citizens to this extent in that they had learned to respect property rights and did so not out of fear but by reason of preference.

All down through the ages, from Greek times at least and probably earlier, the one consistent meaning found in the writings of those who have been and are trying to think straight about the matter is the notion that *learning is becoming* and that the product is a new birth in the individual, a changed point of view, a new taste or set of values, a new inward ability. The French have it in their expression *savoir faire*.

Thus, *every step in the development process for which we use the term education is a piece of learning, or a learning product, and the learning process is the change in personality which constitutes a new insight, or sense of value, or ability.* With the adaptive process itself we shall have much to do, as well as with different kinds of learning products. Meantime, we have seen what we shall mean when the word "learning" is used.

Furthermore, we may find in the individual perverse as

well as right learnings. We all of us have them to a greater or less extent. So phobias, obsessions, and kindred subjects of the kingdom of evils, are just as truly learnings as are reading and the understanding and use of the equation. Mistaken notions in science, or others of the classroom learnings, are to be understood as just as truly learning products as are the right learnings. Only they are wrong learnings.

PERSONALITY

We shall have much use for the term "personality." Now, while we shall not be able to offer a very convincing definition until we have studied our main problem a good deal further, we can set up a provisional definition and state that in our use *personality is the sum total of what an individual has come to be by learning the cultural products of social evolution.*

INSTRUCTION

The process through which education is brought under positive and systematic control and guidance is instruction. "Instruction" comes from a Latin word, the root meaning of which is "to build into." Even in Roman times the word had taken on the derived meaning of "teaching." The word is etymologically pretty nearly equivalent to our expression "bringing-up," as applied to the rearing of children.

Of course, like most nouns and their cognates, especially in a living language, "instruction" has come to have a host of derived meanings. That is well enough, provided people who have to employ terms which are related to the educational process confine themselves to exact and consistent usage so long as they are talking, writing, or thinking about the educational process.

Education, as we have seen, goes on anyway, for better or worse. Much of it is necessarily under the direction of the home, so far as it gets any guidance and control at all. The guidance of the home is ordinarily unsystematic, but, save for that feature, it is as truly instruction as anything which is carried on by the school. Only, in common use, we distinguish between what goes on at home and what is done more systematically at school as "upbringing" and "instruction" respectively, and here common use is good and critical use.

Instruction imports whatever the school does which has as its immediate intent the furtherance of right education.

Thus teaching is instruction, but not all instruction is teaching. Curriculum planning is an instructional process. Personnel work in its various aspects is instruction. So is the selection of textbooks and instructional apparatus, and the maintenance of library and museum.

Provision of school buildings and their maintenance and operation, general administration, provision for necessary pupil services, are not instruction. They must be attended to in order that instruction, which is the main business of the school, may go on, but they are not instruction.

And so it is with the conservation of the health of pupils, in so far as the school is responsible for health. Bodily health is a prerequisite for the most effective instruction, but it is not instruction. On the other hand, when the purpose of certain activities is to cultivate intelligence about health and to create good health habits, the activities in question constitute instruction.

The meaning is then clear. Whenever we use the word instruction we shall use it in this meaning. Wherever

this meaning occurs, we shall apply to it the term "instruction."

TEACHING

In the broadest sense, *teaching is that intimate contact between a more mature personality and a less mature which is designed to further the education of the latter*. Nor is general maturity in the teacher necessarily implied. It is conceivable that an illiterate father who is in some respects mature might resort to his child for instruction in reading. If any results accrue, the father has been *taught* and the child has been his *teacher*. If the child were to suggest exercises through which the father might learn, instruction would be involved but no teaching. If the father were to learn by himself, without guidance or advice, *no instruction would be involved nor yet teaching*.

Games are sometimes carried on under guidance, with the expectation that either physical or moral advances will result. Instruction is involved, but no teaching. On the other hand, a coach may stand by and not only explain what must be done but see that it is done. The coach, for the time being, is teaching.

Some of the most vital parts of right education are achieved apart from any teaching at all. The most conspicuous illustration is found in that part of normal personality which is commonly called moral character. Here teaching is of little avail, for the chief influences that can be brought to bear are the school government and the general morale of the school. If, on the other hand, a systematic course in ethics is offered to the more advanced pupils, teaching is necessarily involved.

In short, the essence of teaching consists in the intimate personal contact to which reference has been made.

Teaching imports that subject matter requires elucidation of some sort and *further that the more mature person feels a responsibility for seeing that the less mature learns.* Its chief instruments are suggestion and constraint. In the case of father and child which we have imagined, no child who undertook the instructional task would for a moment feel that he could stand by and watch his father learn. He would feel called upon to exercise ingenuity in seeing that his father did learn. Such is the teaching situation always.

As schools go, very little teaching is done, even in those situations in which teaching is required by the nature of the instructional problem. Lessons are heard, activities are supervised, the pupils are kept in order, but none of these is teaching.

Didactics

The body of principles which describe and explain the teaching process is known as "didactics." Now, "didactic teaching" has frequently been held up to scorn. Something illiberal about it, I suppose. You might as well find fault with "teaching teaching." In truth, what was really censured, and justly, was the practice of submitting some educational objectives to the teaching process which in their nature do not admit of that kind of instructional procedure; and, further, the practice of requiring pupils to con books in fields of learning where the learning required could take place only by contact with various concrete objects and processes.

The first of the two contentions has already been illustrated by the case of instruction in moral character. In the second, laboratory teaching is involved.

Laboratory teaching. If it is found to be necessary that

either pupils in school or students in the university should take on learnings such as those which are involved in the cooking of meals, the raising of crops, the manipulation of machines, the processes of chemistry, the structure of the human body; the instructional processes cannot be carried on through descriptive books, nor yet classroom teaching, however inspiring the latter may be. You have got to get down to the handling of things or at least to assured visual images of processes at work.

Thus laboratory teaching. Laboratory instruction is, however, as truly teaching as is classroom instruction. It is as truly didactic.

If the end of teaching cookery is to cook food, that is one thing; if the end is assured learning of principles which the girl would not be likely to acquire from a cook book, then that is quite another thing.

If carrying out the directions of a manual in chemistry and filling in blank spaces in a prepared notebook is what is required of the laboratory in chemistry, then neither teaching nor any other aspect of the instructional process is called for — nor will any learning result, save by chance. If, on the other hand, the objective is the insights which the science of chemistry is capable of generating, then teaching and a great deal of it is required.

And so it is with the other processes which I have drawn in illustration, and others as well.

On the other hand, if an advanced student in the university is working out a problem in a laboratory, he requires no teaching. He consults his professor and that is what the latter is for, but he does not require that the professor stand at his elbow to see that he learns the right thing. The high-school pupil does require just that, else he would no longer be in the high school.

Erroneous use. The word "laboratory" means a place where work goes on, but it has come to possess not a derived but rather a particularized meaning. It means a place in which science is pursued with the aid of apparatus designed for the purpose. A place in which an art is similarly pursued is called a "studio." There has, however, grown into scholastic use the expression "laboratory method," referring to the practice of having pupils in history, literature, or other schoolroom subjects, use several books, in substance use a library, instead of conning and reciting from a single textbook. Now this is an unjustifiable use of words, and it is a singularly confusing misapplication of terms. The practice referred to is merely the normal or natural procedure in teaching where the pupils of necessity use books.

Lecturing. Much as in the case of "didactic teaching," "lecturing" has fallen into disfavor as a "method of teaching." Again, an wholly indiscriminating use of terms.

Lecturing is no more teaching than writing a book is teaching. A lecture means literally a reading. The common meaning given by the International Dictionary is "a discourse on any subject, especially a formal or methodical discourse, intended for instruction; sometimes, a familiar discourse, or one delivered on an irregular occasion, in contrast with a sermon."

Now lecturing is an entirely inappropriate form of instruction below the university level, for the simple reason that it implies maturity and educational responsibility which the pupil does not possess. When the latter is capable of profiting from a course of lectures, he has ceased to be a pupil and has become a student.

Per contra, the lecture is the appropriate form of uni-

versity instruction, save in those cases in which the laboratory or the seminar is the form indicated by the particular process being carried on.

Nor does it follow that any piece of schoolroom explanation which extends beyond a few minutes is a lecture. To call it that is to give it a name which does not belong to it.

Discipline

Discipline is sometimes teaching and sometimes not. Teaching for the most part bears no relation to discipline, but some phases of teaching are discipline,

The word itself is derived from *discipulus*, which means pupil or follower. The Latin form is still retained in "disciple." We are, however, more concerned with the derived than with the etymological meaning.

The meaning always has in its connotations the sense of constraint of some kind, but it also has the sense of willing acceptance of constraint, a feeling that this or that "is or is not done." Thus we speak of a school as being well-disciplined when the pupil body acts as a whole readily and when the public opinion of the school accepts right standards of conduct and condemns wrong standards. Similarly, a military company or ship's crew is well disciplined when it does its work with alertness, precision and satisfaction. In short, discipline amounts to restraint on the waywardness and self-will of the individual and constraint of all individuals in the way of group welfare and purpose. Thus all groups have to submit to discipline, in the interest not only of the group but of the self-respect and happiness of individuals within the group as well. The principle is as true of university faculties as of school children. About the only difference is in the

fact that children cannot be supposed to have learned the value and meaning of discipline, while older people, and especially cultivated, civilized people, can be presumed to have done so. Unhappily, the presumption is often not borne out by the facts.

Now discipline is a process and the product is morale. Here as elsewhere, infinite confusion in thinking results from careless and indiscriminate use of terms, notably in confusion of process and product.

A school, for instance, is held down by mere main strength. That, no doubt, is often a necessary early step when the group has been badly demoralized (morale destroyed) by previous lax discipline; but in itself such government does not operate to restore morale, which always has in it the implication of preference and willing acceptance on the part of those governed. Shrewd observers note that not morale but subservience is characteristic of the group. They rush to the opposite extreme and conclude that all discipline is wrong in principle.

Conversely, the operators of such methods themselves often mistake process for product and conclude that when they have good order the essential result is secured.

So much for that aspect of discipline which operates on the group as a whole and properly conceived secures morale. The process is government and not teaching.

On the other hand, some of necessary teaching is in the nature of discipline.

Time was, and not so very long ago, when the school subjects themselves were referred to as "disciplines." There was a kernel of truth in the characterization, in so far as such use of terms carried with it the implication that subject matter is valuable not in itself but for the sake of its contribution to developing personality. More

often, however, in all probability, was the implication that subject matter itself acts as discipline in the primary meaning of the term. In other words, certain subjects were supposed to have much the same kind of effect on mental powers as the use of apparatus in the gymnasium has on the muscles. This last view has long since been exploded.

It is none the less true that certain essential learning products can be attained only through what are in their nature disciplinary measures on the part of the teacher. Illustrations follow.

Learning the use of language, for example, is in large part a matter of learning through practice in the expression of thought. It is also in part a matter of acquiring insight in the structure of the sentence. But it is further a matter of practice under the constraint of the teacher. "Do you mean what this statement says?" "Does this pronoun agree with its antecedent?" "Is this a sentence?" "You know better than to employ that construction or this form of punctuation." These, and almost innumerable other instances which might be cited, are illustrations of disciplinary use of teaching, the essence of which is specific developments of volitional control in the use of language.

Again, we almost never offer in schools systematic courses in logic. To do so might be a poor way of securing habits of accurate thinking in pupils. At all events, we could scarcely hope that any such course unaided would secure the result desired. For one thing, instances of bad thinking are so varied in character that they refuse to conform to any particular pattern, or even series of patterns. Hence teaching logical thinking is in part much as language teaching is in part — disciplinary in

character. "If this is true, does it follow, as you say here, that this is also true?" "This line of reasoning does not prove what you think it proves, but rather this."

Once more, habits of concentration or sustained application, sustained attention over an extended body of thought, devotion to tasks which are initially uninteresting, and similar forms of volitional achievement, cannot be learned out of illuminating exposition, or inspiring exhortation, or book assignments, or from the government of the pupil body. They must be learned through practice, and, since no pupil can be presumed to have the learning objective in mind beforehand, they must be learned through practice which is under constraint. This is a disciplinary aspect of teaching.

PUPIL

A *pupil* is a member of a school who in the nature of the situation must be "under tutors and governors." The pupil becomes a *student* when he has passed out of his pupilage and is qualified to pursue his studies independently of tutors, or, in our use of terms, teachers. Thus the pupil is the subject of instruction, just as the *patient* is the subject of medical care, or the *client* of legal care, or the *child* of parental upbringing. Pupilage is a recognized status both in law and in social structure. The youth of society are said to be *in statu pupillari* when they are within, and under the direction of, the school.

CURRICULUM

The curriculum is the body of learnings which are presumed to constitute the content of right education.

A variety of scientific methods of attack on the problems presented by curriculum construction have been

proposed, and more or less tested out, within the last few decades. However much disagreement in detail of method there may be, the conceptions which underlie them all can, I think, be covered by the definition as stated above.

Thus, reading is an indubitable element in the curriculum, but what is meant is the learning product which is called reading and not a certain round of reading books, nor years of instruction, nor methods of teaching.

Similarly, neither arithmetic nor history, nor civics, nor physics, nor English composition, nor French, it may be, is curriculum content, but rather the learnings which come out of them.

The curriculum is necessarily determinate, albeit we have not yet determined it. That is to say, so long as education is necessarily a matter of adjustment by process of adaptation and so long as the object of adjustment is a world which is common to all mankind, it follows that it must be possible to construct a curriculum which is objectively valid. Any other view of the situation takes us outside the range of science altogether and carries us in one way or another within the range of politics.

In thinking about the curriculum, we are very prone to confuse the curriculum with methods of teaching. This outcome is found when a series of bound volumes entitled "Curriculum of — Public Schools" is primarily a manual for teachers. Still more often perhaps is the curriculum confused with the program of studies.

PROGRAM OF STUDIES

The program of studies, or course of study, is a list of courses properly organized in learning units, intended to be pursued by pupils, and presumed to be the best method of attaining the objectives set up by the curriculum.

Thus, the issue whether reading shall be taught at all or not is a curriculum question. Where, in the school career, it can most advantageously be taught is a program question.

Whether or not and why history and geography shall be taught, what kind of conception of the subject matter shall be held, what learnings are essential — all these are curriculum questions. Where the courses shall be placed and how they shall be organized for teaching purposes are problems in working out the program of studies.

On the other hand, circumstances may make it impossible for a given local school system to cover the curriculum of general education. What devices shall be adopted to cover as much as possible is a program problem.

Finally, we know that some pupils, as we find them and are obliged to deal with them, are incapable of education to the full extent of the curriculum. In most cases, incapacity resides in meager cultural background. For these pupils, we must devise special programs and sometimes special schools.

The curriculum is thus determinate and in its nature a reasoned inference from education itself and from the structure of civilization. It is experimental only in the sense that the products of all cultural evolution are experimental. The program, on the other hand, is variable as circumstances decree. It is experimental in the sense that it should in its nature be modified in accordance with the results obtained in fitting the school to the requirements of the curriculum.

Course. A course in the sense in which we shall use the term is a limited functional element in the program of studies. In our use of the term, we shall not at all mean a body of subject matter pursued for a single school year or not less

than thirty-six weeks, in a class meeting not less than four times weekly, and in class periods of not less than fifty minutes.

Thus, if we organize a course in reading for the purposes of instruction, the limitations are those implied in the attainment of the learning product contemplated. It makes no difference whether six months or three years is the time required; reading is the course.

If a course in elementary geography is set up, the course is the units of learning deemed desirable in the program instruction determined upon. Three years may be required; but there is one course and not three courses. On the other hand, a different and later course, commercial geography for instance, may be offered. That will be another course, not because it comes at a different point in the program, but because it has a different content and a different set of curricular objectives.

Conceivably, several courses in a foreign language may be provided. If such is the case, what makes them courses is the character of the learnings aimed at. It may be that one of them will be reading, another grammar, and a third literature.

Some courses, the best illustrations of which perhaps are courses in appreciation in the fine arts, may extend throughout the school career.

II

We sometimes find old documents containing the memoranda of the founders of various schools and colleges, and in them find the statement "I would have," followed by what in effect was the founder's theory of instruction, expressed as what he would like to have his school do "in the interest of education." That was well enough

for the time and it was certainly a good deal better than nothing at all, for it did no doubt tend to impart to the school a character of coherency where otherwise there would be chaos. But the founder seldom had any valid reasons for his wishes other than that they seemed to him right and proper, and he had the wealth with which to secure the attainment of his wishes. Even so, pupils or students were under no compulsion to resort to his foundation if they did not wish to do so. In fact, the courts have rather jealously guarded the right of citizens to have that kind of instruction administered which they desire, so long as the fundamentals of citizenship training are provided for, and so long as the citizens concerned pay the tuition charges.

But whether or not the founder's scheme would attain the ends which he probably had in mind was a determinate issue, that is to say, it either would or would not. What we commonly call natural law would be in control. Probably in most cases both the founder and the parents of the pupils stereotyped the scheme and substituted it for the values it might be supposed to generate. If the ancient classics were the core of the scheme, that was that; you wanted the classics. Equally so with the opposite attitude; you would have them not.

Now when the school ceases to be private, becomes an integral part of the government, and is supported by general taxation, the whole matter becomes, not different, but much more serious. We are driven to find some coherent body of principles which take the whole issue out of the domain of chance and empiricism and also out of the range of individual desire, that is to say, out of politics. To that end, we are obliged to look for a scientific foundation upon which a valid Theory of Education, and by im-

plication, a Theory of Instruction, can rest. It is no easy matter, for search really compels us to inquire into what science can fairly be said to have established regarding the nature of Man as an organism and his place in this earthly scheme of affairs. Nor can we hope that the case is all in, or anything like it. It is far better, nevertheless, to gather up what we already know, and reason accordingly, than to rest the issue indefinitely on chance, not to say fancy and caprice. Thus we proceed to inventory our principal sources.

ORGANIC EVOLUTION

The scientific world universally holds Man to be a part of the order of Nature, a member of the animal kingdom, and to have come to be what he is as an animal through a long process of adaptation and survival. Some people, no doubt justly, hold that he is much more, that we must make a distinction between the only member of the genus *homo* and Man. Such distinctions are, however, at present beyond the reach of science and we are, I suppose, prepared to rest our feet as securely as we can on the firm ground of knowledge. As soon as we depart from that position, it is very easy to get into the speculative vagaries of educational philosophy. However appealing that branch of reading may be, it is quite impossible to found thereon anything like a concrete theory of instruction.

Science is, however, prepared to say that despite Man's place in nature and his membership in the animal kindred, he is in essential respects wholly different from any other animal that has ever lived on the planet. But these differences as they are known to science are nothing which is mystical. On the contrary, they are concrete, factual, accessible to common sense.

And so, first among our sources are the principles and disclosures which have come out of the studies of organic evolution. Nor are these more important than the methods of thinking which have been employed in and grown out of these studies. We shall find these methods of thinking extremely useful, both in our study of education itself and later in our reasoning about the content of the curriculum.

BIOLOGY

Pupils are before all else living creatures; nobody would question that statement. And yet, both in the classroom and in the management of schools and school systems, they are frequently dealt with in fashions which would be justifiable only on the theory that they are in essential respects the same as industrial goods in the process of manufacture. General biology deals with the nature of living things. It is critically necessary among our sources for two reasons:

In the first place, its disclosures amount to knowledge which is indispensable in our thinking about education, the product of education in personality, and the processes of instruction. That is notably true of one of the branches of biology, namely genetics, for school people are never able to think correctly about the processes which go on in the school, or indeed about the possibility of education itself, until they have a firm grasp on what is and what is not transmitted in the germ plasm, and in general not until they can intelligently assign values to the consequences of physical heredity.

In the second place, since all of instruction is included within the technologies which deal with organisms, the initial, if not the fundamental rational methods of attack

on instructional problems are biological in their nature. If the reader will reflect a bit over the history of promising technological devices in instruction which have appeared within the past quarter-century, he will, I think, be impressed by the extent to which they have been predicated on the methods of physics rather than on those of the science which describes the material upon which the teacher and schoolmaster operate.

GENERAL PHYSIOLOGY

However acutely we may be concerned about the health of school children and about what is called physical education, teachers have no occasion either in principle or practice to treat the physical maladies of their pupils. That belongs elsewhere. Nevertheless, we get a great deal of light on our fundamental theory of education and of personality, and by implication on the processes of instruction, from general physiology, and we find the light we are looking for nowhere else. This field of scientific inquiry deals with organismic functioning and with the relations of function and structure. It helps us to understand organismic processes in general, not merely organic processes, so much so that we get visions of great underlying principles that operate even as far away as the field of purely mechanical devices.

HUMAN PHYSIOLOGY AND PSYCHOLOGY

In the end, the adaptive organism which enables the individual to make fitting responses to environmental situations and, what is more important, to become the kind of individual who will be more and more likely to make fitting responses in all kinds of situations, is described by treatises in human physiology and psychology.

It is well nigh futile even to attempt to understand the educative process and to pass from that to an intelligent apprehension of the process of teaching and the foundations of the curriculum without at least some elementary grasp of the principles set forth in both physiology and psychology.

In the first place, these sciences give us an understanding of the nature of the adaptive organism and teach us a great deal, enough for present purposes, about its functioning and the inter-relations of its functions. In its specialized branch, modern neurology, physiology makes clear sundry fallacies, particularly as to the functions of the brain, upon which theoretic instruction has mistakenly been prone to rely for a long time.

In the second place, we find therein our bases for understanding the place of the adaptive organism, what it does and what it does not do, what is organic and what is personal, what is process and what is product.

In the third place, the psychology of abnormal and sub-normal people gives us a basis for much of our theory of personality. The misfortunes of these people are sometimes referred to as episodes in Nature's experimental laboratory. However that may be, we commonly learn more from organisms and mechanisms that have gone wrong than from those that have gone right. It is likely enough that we should have had neither physiology nor physics if there never had been disease and if all machines had worked perfectly from the first.

The foregoing studies throw light chiefly on the educational process and only by implication elsewhere. They go far to explain the nature and purpose of adjustment by adaptation, but they shed little if any light on the adjustments which are required. For that we must

turn to the sciences which deal with Man, with society, and with Man in society.

ANTHROPOLOGY

The first of these is anthropology or the natural history of Man. The primary, if not the only, objective estimate of what we find in human nature and society is found in the answer to the query, How have these things come to be what they are. Scientific anthropology, in contrast with its metaphysical brother, goes far in the direction of enabling us to understand what Man has come to be since he stood upon two feet, began to talk and to use tools. In its branch, ethnology, it gives us the origins of culture and civilization and a basis for understanding and defining institutions, which is not only the most critical but the most formidable task we have.

SOCIOLOGY

Perhaps the most important single source we can find for the purposes of our study is in sociology, which we understand to be the science which deals in the most general way with society itself, endeavoring to get at its origins and evolution, its structure, its functional elements, and its pathology. Sociology is not the only social science. Economics, civil law, jurisprudence, politics, ethics, are all of them social studies, and so, it might be claimed, comprehended within the general field defined as sociology. Practically speaking, however, and in actuality, all of them are older, have had independent origins, and stand on their own feet today.

Nor are we interested in sociology as a study of the current social order, and the discontents of various groups and individuals therein, save as such are manifestations

of social pathology, evidences of something that has gone wrong, and hence capable of throwing light on what has gone wrong and why.

We are chiefly interested in evolutionary sociology and above all in its discussion of *folkways* and *mores*, of their shifting character and importance, of the emergence and evolution of civilization, and of the causes which have tended to bring about a relatively stable social fabric. Above all are we interested in the establishment of institutions and in the account of their internal evolution.

OTHER SOURCES

We can hardly claim that the sources we have listed exhaust the possibilities of enlightenment. In fact, there is seemingly very little in human experience which cannot be given an educational significance and which fails wholly to suggest instructional improvements. The whole course of human history is a source and particularly many individual studies in the history of culture. Nevertheless, whatever is valuable for our purposes in studies the titles of which could hardly classify in any of the sources which have been named can almost always be assigned as contributions to one or another of the fields. On the other hand, the student who takes a library catalogue and merely runs through the titles which are classified as Evolution, Biology, General Physiology, Human Physiology, Human Psychology, Anthropology, Sociology, will not only miss much but will likewise prepare to delve in an enormous amount of reading which has little or no bearing on the present study. The student's preliminary difficulties I shall attempt to meet by listing, from chapter to chapter, readings which do throw light.

It is sometimes said that a lawyer needs to know a

little of almost everything. The statement would have even more truth if it were applied to the schoolmaster and student of instructional processes, who really desires to be a master in his own field. The perils of specialization are perhaps greater in our calling than anywhere else, but so likewise are the perils of ignorance. No man can pretend to be a master in more than one of the sciences which lie at the basis of an adequate theory of instruction. Happily, there is no necessity. Progress in digesting and standardizing findings in most of the scientific fields is so rapid that any diligent student can build up at least intelligent attitudes in all the fields which are capable of throwing light on his problems. I do not mean by this statement that he should allow himself to get into the habit of depending on semi-popular works or upon articles in current popular periodicals, even though both be written by qualified scientists. Still less should he depend on allegedly scientific and historical works written by journalists who are neither qualified scientists nor scholars.

Such is the attack on the groundwork of our inquiry. We ought next to get some light on what education, as we have defined it, in its nature is. That will require considerable study of Man's place in Nature; of the adaptive organism through which contact with the external world is made and which is the instrument by means of which personality develops; of the nature, structure and maladies of personality itself.

CHAPTER III

MAN AS A PRODUCT OF ORGANIC EVOLUTION

IF WE would eventually build a coherent and defensible school system, one which works and produces values which are serviceable in transmitting civilization and holding society together, one which is most likely to be effective in bringing about a society in which the good life is in actuality common to all mankind; then we must all of us lay aside our prejudices, our individual views about what ought to be done, even our aspirations, and turn toward an impartial study of the process of education itself, in other words try to find out what education is rather than what we think it ought to be. It is of no service whatever to theorize about the curriculum, about teaching, about the school system, even about school management and administration, until we have a defensible theory of education, defensible on scientific grounds rather than on appeals to mysticism or to philosophical speculation.

That being granted, we naturally inquire, Where shall we start? How shall we get our feet placed?

There is but one starting-point. If we seek light on the eternal question, How did we get this way? we shall probably get light on the only objective basis on which our thinking about living things and social processes can rest. At least we shall get oriented.

The most important generalization of modern times, probably the most revealing of all times, is that contained in the doctrine of evolution, the first satisfactory

statement of which, as applied to living things, was contained in Darwin's *Origin of Species*.

The contrasting view of the world is that contained in the doctrine of special creation, the notion that whatever is has come into being either as the result of divine fiat or else as the product of heroic invention. We are accustomed to see the contrast chiefly in the mutual polemics of religionists and evolutionists. In reality it goes far beyond that.

Primitive man has no notion whatever of the distinction between agency and causation. He sees his neighbors doing things and observes that there are consequences. Hence, whatever is came about that way; somebody did it. For this reason, he sometimes suspects his neighbors of witchcraft. More often, he attributes things to ghosts or demons, and so he attempts to square himself with these. After civilization has had time to advance somewhat, he becomes aware of what we call a State, or perhaps social institutions, and so he attributes these things to legendary heroes.

In modern times, at least in civilized nations, there are comparatively few primitives so far as comprehension of the physical world is concerned. Very few of us attribute an excessive rainfall or a prolonged drouth to human agency, or to any other kind of agency. To that extent we are aware of causation, and we attribute neither justice nor injustice to the dispensations of physical law. The evidence is entirely clear, however, that the majority of people are still primitives in most that relates to life and in all that relates to society. If one does not prosper, somebody is to blame, probably the governmental administration which has the bad luck of being in power at the time. If more corn and wheat and cotton are raised

than can possibly be used and therefore sold, there is injustice somewhere. Somebody is to blame, not the witches of course, but perhaps the "interests" or the "international bankers" or fiends in human form who manipulate the gold supply to serve their own ends.

At a somewhat higher level, some college-bred folk entertain expansive notions which include the invention of what they call a new social order. Whether they realize it or not, they are in fact doing exactly what the people of the stone age thought had already been done for them.

The truth of the matter seems to be that whatever is has come to be what it is because it had to, circumstances being what they were and what they perhaps still are. The wise thing to do is to accept the universe. When we have made up our minds on that point, we can often come to understand the universe and by obeying its laws keep ourselves more or less out of trouble. In the end, we may even remold the sorry scheme of things according to heart's desire. Only we must first inquire whether heart's desires would really be what we do want.

And so it is with the school system in all its moods and tenses. There, as perhaps almost nowhere else, futile invention reigns supreme. One system after another is invented and usually the invention springs out of thin air or out of the cloistered inspiration of an educational seer. Even when people attempt to reason out various instructional processes and to relate them to known facts or to accepted principles, they are likely enough to suffer apotheosis as the originators of "plans." In brief, the one factor which Utopias of all sorts — religious, economic, political, educational — have always left out of account is human nature.

And so the thing to do in order to get firm ground on which to balance ourselves for our flight from mythology and the reign of chance is to recall and review our notions of how this pupil who is given us to instruct happens to be a human being, instead of a vegetable, or maybe the wildcat which he sometimes resembles.

I

HOW CAME IT THAT WE ARE HUMAN BEINGS?

To trace the whole story of evolution in the animal kingdom from unicellular animals to humans would not only be a formidable task but would likewise hardly serve any useful purpose in our present study. The reader who needs to go farther with the subject and cares to do so will do well to begin with the references included at the end of the present chapter. Rather shall we review the critical evolutionary processes which seem to have been in control. These are *Variation, Inheritance and Survival of Adaptations, Adjustment* to living conditions being the outcome.

Variation

When the story has got fairly well under way, perhaps the most striking phenomenon which we should note if we could behold all the phenomena, is *variation among the individuals of the same organic form*. No two are exactly alike, and in the lower forms of life differences may run to extremes, so much so that what would be a nine-days' wonder in the barnyard as a two-headed calf would utterly fail to make the front page in the world of flat-worms, if such creatures had newspapers.

Now what makes variation is more or less an enigma, unless we are satisfied with the doctrine of chance as an

explanation. Anyhow, variation occurs, and upon that circumstance rests the whole process of evolution into more and more complex organisms, into creatures that range through the world more and more widely, in brief into forms of animal life that are better and better fitted to survive in a changeable environment.

The nib of the matter, at least one nib, is that some variations are inherently better fitted to live than are others; and since they live longer, other things being equal, they are more likely to have offspring and to have more of the latter. It does not follow that all the offspring will inherit the favorable character present in the parent; a good many will not. But some of them will, and at all events the unsuited variations will not transmit favorable characters, since they have none to transmit. So we come to the other nib of the matter, which is heredity or the tendency of a given character or trait in the parent to reappear in one or more of the progeny.

Heredity

A great deal of scientific knowledge has been accumulated, touching not only the facts of heredity, but also the processes through which it operates. Moreover, the gross facts are accessible in the common experience of everybody, and especially in the somewhat specialized experience of those who breed plants and animals. Nevertheless, there are few subjects on which people have been, and still are, so willing to set up debates. The heart of the matter is not so much in the facts as in what the facts mean. With that we shall have a good deal to do in our later study of some crucial issues. At present, however we are dealing only with the principle of heredity in evolution.

Now variations in organisms would have no special

meaning if they could not be passed on to the next generation. No doubt they would contribute to the charm of social intercourse if the lower creatures have anything of the sort, but beyond that they would be meaningless. It is the fact that they are passed on which permits favorable variations to accumulate and unfavorable ones to disappear.

It is sometimes said that variation is the radical element in evolution and heredity the conservative. So it is. If variation could run on without heredity, all life would promptly become a collection of ridiculous monsters and only less promptly disappear. If there were only heredity and no variation, life would still be what it was in the pre-Cambrian seas. The consistent antagonism of the two results in progress.

This principle of mutual inhibition is one of those encountered in all study of existence. It has organismic implications and indeed it contributes somewhat to our philosophy of life. We find the principle in physiological processes, in the structure of personality, in the design of machines, in societal functioning, even in the organization of States. It appears in the antagonism of acceleratory and inhibitory nerves, in opposing muscles, in personal integration, in automatic controls in engines, in supply and demand, in the mutual checks between the aristocratic and the democratic elements in government. Wherever we meet existence, we find that if one member of the pair is abolished chaos results; if the other member, then stagnation or actual cessation.

Survival

That which survives is in the long run that which is fit to survive. How so?

Here enters the principle which governs all life and to which all our thinking must be referred so long as we study education, instructional processes, schools and schooling, and society itself. That principle is adjustment to environment in the broadest sense on peril of extinction or at least misery to self and others.

Every organism is to a greater or less extent in competition with all other organisms for food, for escape from becoming food, and for the opportunity to reproduce itself. It is further in conflict with the forces of inorganic nature, with climate, directly or indirectly with the soil, with tempest and flood, with mountains, deserts and forested areas. And finally it is under the handicap of its own specializations. The more of the latter there are, the more difficult is organic change by variation and survival as life conditions change.

Every variation in a given organism runs the gantlet of ruthless testing. If it is better adapted to live in the total environmental complex in which it is found, it has a better chance to survive and to survive for a longer time. The unfortunate variations have not only a poorer chance at securing food but a better chance of becoming food. Of the myriads of variations that occur, all but a very few are either handicaps to the organism or else matters of indifference so far as adjustment is concerned. Only very, very rarely does one occur which constitutes a distinct betterment and not all these rarities survive; they only tend to survive. Thus a given organic type, be it a primitive worm or one of the much later quadrupeds, tends automatically to improve in quality from generation to generation because its favorable variations are constantly being selected by competition and its unfavorable variations are as constantly and automatically being

eliminated. Thus the horse first appears on the scene as a little animal, about as large as a fox terrier perhaps, and the process which has just been noted in due season produces the glorious creature which we know, or rather the animal as he was before men domesticated him and improved the type to suit their needs by doing artificially what had previously been done naturally.

But the organic types themselves, that is, different species, are involved in the same competitive examinations. Untold thousands have disappeared without trace other than the fossil remains that some of them have left.

Ordinarily, the story of extinction is one of some change in environmental conditions. A change of climate has come on faster than could be taken care of by the process of variation, inheritance and survival. Or, more likely, some other organism evolves more rapidly and eats the first one up. Or the competing organism drives the other out into an environment in which it cannot survive. In any case, the unadjusted animal becomes extinct. Perhaps a whole species suffers the same fate.

In a few instances, the environment has remained practically constant over the whole of zoölogical time, so that creatures now living seem to be much the same as fossil remains, left behind hundreds of millions of years ago, lead us to suppose that their extremely remote ancestors were. Such species became stabilized or balanced because they long ago reached a stage of perfect adjustment.¹ Beyond that point, any further variations whatever would be unfavorable and would be eliminated. I suppose such

¹ See H. F. Osborn, *Origin and Evolution of Life*, 121. The prevailing tendency seems to be to make a much more generous time allowance than Osborn here admits.

See also Petrunkevitch, *Environment as a Stabilizing Factor in Organic Adaptation to Environment*, Yale Lectures, 1924.

creatures are happy; at least they are not vexed by the vain pursuit of progress for its own sake.

The pains of specialization. Sometimes different forms have become admirably adjusted but so highly specialized that they were inherently incapable of further evolution. They survived until the change came and then they went under.¹ Some of the extreme specialists apparently became extinct under the burden of their own existence, the Mesozoic dinosaurs for instance. In a way, they knew more and more about less and less until they knew everything about nothing.

All in all, the long process which has carried animal life from unicellular creatures to Man can be likened to a tree.

The line of evolution for all at first has been along the lower trunk. Some have evolved but a short distance and then have become extinct.

Some have climbed to the lower branches and out on the branches. Of these, some have become extinct and some are still sitting on the branches, unable to develop further. Thousands of these branches remain, most of them adjusted to a narrow habitat. Some of them, like the birds, are adjusted to a very wide habitat indeed. In fact, the birds in this respect are excelled only by Man, but still they are a branch of the tree and out of them can never come anything but birds.

Some, on the other hand, have kept to the main trunk. Evolution has run from one species to another along the conservative line until, not to stretch the analogy too far, Man is the terminal branch. Along this line there has always been evolution from one form into another form. Man's physical descent runs along the trunk of the tree,

¹ Osborn, 159.

through the non-specialized rather than through the specialized forms.

Adaptation

The process which has been sketched in the last few pages is "adaptation"; the result is "adjustment." We shall have much use for these terms, and so it is perhaps best to pause and see just what it is that we mean by them, that is, "to come to terms."

Adaptation in the broadest sense signifies a process. Used in that sense it refers to changes in an organism going on by variation, inheritance and survival and eventuating in better adjustment to life conditions. But it also means a product. When used in that meaning, it refers to the new character itself. Since we dislike to use the same word to mean entirely different things, we shall use the term "adaptive process" when we are thinking of process and "adaptive change" or "adaptation" when we are thinking of the product. Thus the animal eye is an adaptation, an adaptive change from eyeless forms, the effect of which is contribution to adjustment. The process by which long ago an organ of vision was evolving out of perhaps a pigment spot on the skin was an adaptive process.

Our human bodies are made up of adaptations in both function and structure. We are thereby adjusted to our lives as human beings, at least so far as physique goes. More than that, *the sum total of our adaptations is what we are*, physically speaking. It defines us. Later on we shall find that precisely the same principle holds as to personality: the sum total of our learnings, or personal adaptations, defines us personally.

Physical maladaptation. Now, strictly speaking, there are no such things as actual physical maladaptations in the

race, at least not such as are fatal to survival. True enough, physiologists can count numerous elements in physical structure which do not make for adjustment. Some of them, such as an extra molar and a vermiform appendix, are vestigial remains of former adjustments. Others are features which forbid us to define Man as the perfect animal. But the organism of the normal and healthy individual as a whole is an example of adjustment and not of maladjustment.

Personal maladaptation. Here we have a sharp contrast to what is true of personality. Adaptations therein are in the individual and not the race. There is no remorseless elimination at work by process of natural selection. The establishment of Man in the animal kingdom has taken perhaps half a billion years, depending somewhat on what one conceives the starting point to have been, at any rate an extremely long period. We are lucky if we can get twenty-one years as the space in which to establish personality. And so it comes to pass that, apart from good upbringing and instruction, maladaptations are about as likely to occur in the development of personality as adaptations. Learning is about as likely to be perverse as right.

Adjustment

The fact that a given species is present in the world is itself evidence that it is in adjustment to the conditions of its life. Individual variations still appear. Most of them are weeded out, but the species abides. If the environment is changeless, the species eventually settles down in a state of equilibrium. If the environment changes, the species must change with it or become extinct or else escape into an environment to which it is adjusted.

If previous evolution has produced an unusually good adaptive organism, then the species may come to dominate all creation, until either the environment changes beyond its adaptive range or else until it perishes under the burden of its own excellence.

The drama of animal life

If it were possible to make a moving picture of the whole majestic drama of animal life on the planet, with exposures arranged at intervals of perhaps a thousand years, and if the resulting film were then placed in a projector and speeded up, we could go to the theater and get a visual notion of what has happened.

We should see strange forms of life seeming to change into forms which have a more familiar appearance and these changing into other forms which are recognizable to our inexperienced eyes as being the same as what we see every day, at least in the summer time.

Worms would seem to change into fishes before our eyes, leaving other worms behind. Fishes would change into creatures capable of living either on land or in the water, but most fishes would keep on as fish. The amphibians would become more and more numerous and most of them would be outlandish creatures, familiar enough in some of the less reputable forms of delirium, but not elsewhere. And so it would go. More and more highly organized animals would appear on the screen; or, to preserve the thread of our argument, more and more complex bodies of adaptations. The great bulk of the larger animals would be monstrous and grotesque forms unlike anything we had ever seen. But some of them would seem strangely familiar, and always there would be a less conspicuous background of the entirely familiar.

Toward the end of the show, animal life would lose its strangeness and begin to look much more like the world of living creatures to which we are ourselves adjusted. Just as the machinery in the rear of the hall was about to stop, we should get a bare glimpse of a new kind of creature, like what had gone before and yet very different. He would be standing erect, doing something with his fore paws, and apparently engaged in conversation with another like him.

Stability

We might in imagination arrange to have a single section of a million years photographed in exposures made once every two years instead of once in a thousand years. If this new film were projected as before, we should see the animals of creation going about their lawful occasions, eating and being eaten, but we should sense not a great deal of change in their forms. Doubtless we should feel at the end of the show much as does the elderly gentleman who tells us that "things were different when he was young," for we should feel vaguely that things were surely different at the beginning of the million years. But it would be rather hard to tell how and wherein. To be sure, if the era selected had happened to be one in which unusual environmental changes were taking place, such for instance as a glacial period, we should see more changes, but for the most part the changes would consist in the disappearance of species which were alive and active when the screen first went into action.

Now a million years is a mathematical expression. We can imagine it, but we cannot experience it. Human experience is built up in terms of seventy years more or less, and the uttermost of our vicarious experience is a

matter of five or six thousand years at the most. So it is easy to see why we tend to be extremely skeptical about the whole matter of evolution. "As it was in the beginning, is now, and ever shall be, world without end" is, after all, good common sense, humanly speaking. And so in the vicissitudes of social existence we take comfort in "the eternal hills." The geologist merely irritates us by telling us that they are not eternal. For all practical human purposes they are eternal. The particular hills of our love may conceivably be gone in a few million years and with them somewhat of the animal life which we know, but they will last our time and for all we know the life of our kind of animal. So we view the matter; we are in adjustment.

Since evolution has become popularized, non-professional readers are apt to be greatly concerned about the future and to picture to themselves fundamental changes taking place within a few years. They read a newspaper quoting some professor who says that the race will presently be bald or lose a toe or perish out of gigantism or lose the battle with insect life. Others half digest the doctrine of evolutionary progress and conclude that ten years of chaos would produce so many variations that progress would be simply marvelous. All this is woefully to misunderstand the meaning of evolution.

Even granted that the physical organism is still under evolution, which is to say the least doubtful, discernible new adaptations would require many thousands if not millions of years. Human existence is simply not concerned with such figures as any part of a program of either progress or destruction. The intellectual value of evolutionary doctrine consists in the principle that it defines Man and the World and Society and not in the

principle that it supplies us with a program for the future founded on variation and survival. It looks over the past but does not explain the future. It convinces us that we live in a universe of law. We infer that by understanding and obeying the law Man can more or less govern his life and escape from the pains and penalties of adjustment by survival.

Progress

Evolutionists constantly warn us that adaptive change and adjustment do not represent progress in our sense of progress. Evolution is not politics. Venomous serpents, noxious plants, troublesome and destructive insects, are exactly as representative of evolutionary progress as are the pleasant fruits of the earth, the lovable dog that stretches before the fire, even the children of our hearts. The only kind of progress in which we as humans are interested is human progress under the conditions of human living. We seek to understand Nature, in order to escape what she would do to us if we did not understand. Evolution is not progressive because we judge it to be; we judge it to be progress because it is evolution.

Evolutionists further warn us of the fallacy of teleological thinking, in other words of the "plan" delusion. As religionists, we are welcome to cherish whatever faith appears acceptable to us touching the matter of design behind it all, but we cannot do valid thinking on that basis. That is outside the domain of science. It is not that science denies the existence of design but only that science finds no necessity of design for the purposes of the limited sphere in which science does its thinking. The trouble with us is that whenever we begin to try to reason from design we usually end by substituting our

plan for God's plan. Adjustment is the fundamental fact and point of departure. Starting from that point we gather evidence, reason backward and endeavor to find out how adjustment came about. We are then in a position to reason forward and see what is in fact within our powers. The principle is as good in studying education as it is in the study of evolution. The scientific study of education begins at that point.

Man is the dominant animal because the evolutionary process has produced that kind of animal. As the dominant he meddles with all the life about him, but he does so at his own peril. He cannot meddle with the laws of life; he may discover them if he can, and obey them if he will. Whenever he is successful in meddling, successful from his own point of view even, his achievement flows from the fact that he has found the law and followed it.

II

HOMO SAPIENS

In due course, and very recently indeed, zoölogically speaking, there began to appear animals more or less like ourselves in many ways. They were beginning to get about on their hind legs and more and more to use their fore legs for something else than locomotion. Their brains were beginning to be much like that which we sometimes use. They resembled Man in the care of their young. The zoölogist calls them primates.

Amongst these after a time came forms that are commonly reported by scientists to have been men, but not of our species.

Finally appeared *homo sapiens* standing erect, possessed of a peculiar fore paw, capable of articulate utterance, and endowed with a brain and sense organs altogether in

a class by themselves. He is our pupil. Let us see what we can make of him.

The most important thing about him is a set of vocal organs which are capable of speech. Other animals have in some respects better vision, others are more acute of hearing or smell. Many are more fleet of foot. Some can fly and use the whole range of the climatic zones for habitat. Some are incomparably better equipped for combat. In all-round muscular excellence the cats completely outclass Man — and apparently they know it. But none of them can talk. They give warning cries, and mating cries, and cries to their young; but they cannot talk nor yet can they learn to talk, for they have no organs which are capable of it. Upon this supreme adaptation rests the possibility of language, of thought, of culture, of civilization. More than that, it closes one chapter in evolution and opens another, for it makes possible the beginning of social evolution and of personality.

Next in order is a hand with an opposing thumb and extraordinarily refined and delicate fingers. That makes possible learning to make and use tools. More than that, the arrangement and character of the fingers contain the possibility of the artist seated at the piano and the surgeon removing a tumor from the delicate tissues of the brain.

Only in the third place is the brain, which I suppose most writers would place first.

The body of recent evidence in general physiology, and especially neurology, seems to me to point clearly to the conclusion that the human brain is the implication and not the cause of those faculties which we look upon as peculiarly human. In other words, the way to look at the matter is this: Man is not a vocal and tool-using

animal because he has the right kind of brain; he has the right kind of brain because he has flexible vocal organs and a flexible hand.

Finally, Man stands erect; his fore limbs do not have to be used as means of locomotion.

Just as the human brain is implied chiefly by the speech organs and the hand, so the erect posture is implied by the heavy head as a matter of mere mechanical economy. Organic bodies made up of living tissues do not make good cantilevers. To carry thrust forward on all fours a head weight so disproportioned to body weight would have required an ungainly and uneconomical body, largely made up of muscles and bony structures which would serve no other useful purpose than that of mere mechanical strut and anchorage. An erect structure carries the weight of the head to the ground. Looked at in an anthropomorphic sort of fashion, we might say that Nature could not afford to waste energy on the bone and muscle of a cantilever to carry a thrust-forward heavy head, when she knew that her plans would call for maximum output of energy in the nervous system.¹

Adaptive range

The bodily adaptations which identify humans imply extreme *adaptability* in the individual of the species. Thus Man alone in the whole range of animate things can acquire adjustment not only to a stable and localized environment but to any environment which he has thus far encountered. Alone of all, he is capable of reacting upon and modifying his environment.

Adaptability implies a minimum of native adjustments and a maximum of dependence on individual learning.

¹ See Herrick, C. J., *Brains of Rats and Men*, 42.

To use a venerable illustration, the chick comes into the world equipped for the only career a chicken is capable of. He requires a few weeks of brooding, but even that can be done mechanically. Family connection is apparently not valued. The human young arrives on the stage of his career utterly helpless and equipped only with an organism which is capable of human learning. It could not be otherwise. But his helplessness plus his adaptability implies parental care, the family, society, and eventually, it may be, the World State. In fact, no creature could possibly be so adaptable as Man is on any kind of physical basis; a personal and social basis was implied.

I have made generous use of the word "implies." We are not studying physics. There is little in the course of organic evolution, or in the functioning of individual education, or in society which we shall study later, that suggests the kind of cause and effect which are found in physics. Organisms work as wholes; and the great word here is "integration." No adaptive change can come about in a given organism which does not involve proportionate changes elsewhere in that organism. Nor is there clear evidence that any one such change produces the others. Here, again, it seems to be a matter of variation, inheritance, and survival. Nevertheless, a given favorable change no doubt operates to enhance the likelihood that favorable complexes of other changes will be selected for survival. Thus, there is probably nothing in the brain which produces erect posture and nothing in the erect posture which produces the brain, nothing in the brain which produces the hand and the speech organs nor yet the reverse. Very few thorough-paced evolutionists today hold that the human brain is the product of intellectual exercise or of any other kind of exercise. But

given a survival in any of these variations the others are likely to follow. One *implies* the other, but does not *cause* it. The force of circumstance of which the whole evolutionary process is an expression is the causative factor at work.

This complex of acute sensory organs, voice, hand, brain and erect posture is what differentiates Man from the other primates and from mammals in general. These are the things that count, and not Man's general superiority as an animal. In some essential respects, he is more generalized than are most of the higher mammals and in some respects he is zoologically more primitive.¹

Culmination

Thus organic evolution culminates in *homo sapiens*, a zoological genus in which there is now living but one species. But so far, we have only an animal, a good animal, it is true, but still only an animal. We cannot say with empirical certainty that there will be no further organic evolution. There has not yet been time enough. All the facts available, however, point to the conclusion that the species is physically no better than it was when it left the earliest traces which have been discovered in the caves of Europe. With our present understanding of organic evolution, we do not expect that it ever will yield an higher product, for we can see that with the appearance of Man the course of evolution takes a new direction, namely that of society and of culture. It is as if Nature, after experimenting for several hundred millions of years, had said to herself, "Well, this one is good enough; now for something new."

This view of the situation, perhaps, needs some defense.

¹ See for instance the argument in Wilder, H. H., *Pedigree of the Human Race*, 4.

The thoroughgoing biologist, familiar with the fact that mutations are apparently produced quite as prodigally as ever, can see no reason to think that the future will be otherwise than the past and that therefore forms biologically higher than Man will not eventually arise. He reflects further that had there been a thinker in the universe prior to the appearance of life, the thinker could not have believed that anything like life would ever appear, since there could have been no experience on which to base belief.

The reasoning is plausible, but, as I think, it overlooks some convincing evidence to the contrary.

So far as cosmic evolution has been made out by scientific men, the process has been discontinuous. The evolution of matter and the transformation of energy have gone into the building of more and more complex forms of matter until the stage is reached at which conditions make the emergence of life possible. Thereafter, evolution goes into another phase, namely organic evolution. Finally, an animal form appears in which personality becomes possible and evolution goes into a third phase.

Now there is no evidence that evolution in terms of matter and energy is any different now from what it always has been. On the contrary, there seems to be reason to believe that over almost inconceivable periods of time the energy locked up in complex matter is being released and that on the other hand energy is being re-transformed into matter.

Again, there is no reason to believe that organic evolution in sub-human forms is any different from what it always has been since life appeared. In Man, however, premium on adjustment is different, since personality in a social existence is worth a great deal more than physique.

So much so that apparently there is a natural tendency for the race to run backward, because in society inferior organic types are not so readily weeded out by remorseless natural selection. The race is saved only by personal control, and that makes not for a superior animal but only for more normal and healthy animals.

Such speculations are, however, fruitless, fascinating as they are to many readers. It may well be that our planet will sometime in the course of a thousand billion years be smashed and dissipated in the form of radiant energy. It is conceivable that some of the lower forms of life will evolve and in a billion years make possible something more powerful than personality. Let it come! It won't be next year nor in the next million years. These immensities are unduly overpowering. Who shall be the next President is more important, and certainly what can be done in the next twenty-one years in making civilized persons out of the babies born yesterday.

All through this argument the word Man has been used for the sake of brevity. In reality, in our review of the course of events, we have not yet met Man, but only *homo sapiens*. Whether the two terms are synonymous or not, whether along with *homo sapiens* a wholly different kind of being appeared in the world, is really a metaphysical question. A good many of us think there did. However that may be, it is entirely within the province of science to declare that *homo sapiens* is only the potentiality of Man and that the latter is not the product of physical but rather of social evolution. In other words, Man is a social being and he has to learn to be.

III

ORGANIC EVOLUTION AN EPILOGUE

Now what organic evolution is to the race, civilization is to society and education — that is, development through learning — is to the individual. Fundamentally, the process is the same; the evolution of personality on the one hand and that of civilization on the other are, taken together, a continuation of organic evolution. They are evolution in a new phase. The process may be different, for whereas organic evolution is limited to variation, inheritance, and survival, the evolution of personality and indirectly that of civilization can be brought under control and the process greatly expedited. Apart from intelligent control, the remorseless laws of organic evolution operate as surely in the personal and social world as in that of physical organisms.

The societal evolution of the last six thousand years, or thereabout, has probably covered as much ground, to put the matter conservatively, as did organic evolution from the first appearance of mammals to the establishment of *homo sapiens*. And yet six thousand years is but a pin point on the vast scale of mammalian evolution. On the other hand, six thousand years is but a minor fraction of the period during which cultural evolution has been going on and yet the cultural product of these six millenniums is well nigh the whole of the output of tens of thousands of years — perhaps hundreds of thousands. But some such period as this represents the time during which Man has been more or less capable of controlling his own destiny — bungling the job badly most of the time, but still not merely the sport of variation and survival. Whenever he fails to understand and obey, Nature

steps in once more and resumes her own methods and they hurt.

If we succeed in getting the whole course of organic evolution into some kind of perspective, one of the most striking things about it is its increasing economy and consequent acceleration.

From the fish with millions of eggs and myriad progeny for the sake of a few survivals to Man with few eggs, still fewer offspring and yet an expectation of life at birth of nearly three quarters of the normal life span, is a familiar illustration.

Energy is conserved. Progress is accelerated.

And so it is in society. Progress was slow, wasteful and painful until the social behavior patterns had become so far institutionalized that Man could accumulate capital of all sorts and transmit his learnings otherwise than by the hazardous and wasteful method of tradition. It is easy to see what the key institution was: it was the School.

And so when people plead for maximum individualism, to let the young of the race run wild for the sake of variety, and assert that such is Nature's way, they assert what is not true.

Having in mind then a picture of the evolutionary process, although the picture is the merest sketch, we can turn with some confidence to the educational process itself. In order to do so, however, we shall find it well to begin with a study of the adaptive organism, the physical and psychical instrument through which learning takes place.

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CHAPTER IV

THE ADAPTIVE ORGANISM

IN THE preceding chapter, we have in brief traced the story of Man's origin and have seen that he is defined by what he has come to be, that he is a part of the order of nature and is governed by natural law. We have seen further that out of his biological inheritance, and strictly in continuity therewith, emerged bodily adaptations which made possible something that had never existed before, namely, a new kind of learning, and through that the thing we call human society and personal Man as distinguished from physical or zoölogical Man. Animals, all the way back through the series as far as the lower organisms, had learned, and at bottom they had learned as humans learn, but none of them could learn what the latter could and above all the kind of thing. Man's kind of learning is alone capable of breeding learning, because it alone can leave behind cultural monuments and in the end records of itself in written form. The experience out of which successive generations can learn is greatly expanded. Comparatively minor changes in the organism, zoölogically speaking, made possible an utterly different kind of world, but still a world strictly within that control which we commonly call natural law.

In the present chapter, our task is to study the human organism in general as an adaptive instrument and try to distinguish between its functioning and what comes out of its functioning. Such a study is the second step on our way to conclusions as to what in fact education is.

For a period of about four centuries past, there has

been in progress the building-up of a purely materialistic view of life and society. Interrupted at times, the movement has resumed its sway until during the past generation or two materialistic notions have tended to penetrate and control the reflections of nearly everybody who thinks at all.

Physics and chemistry have acquired the compelling prestige which comes from their nearly perfect experimental form and from the readiness with which their data can be translated into mathematical terms for the purposes of logical analysis. The effect is that it has become exceedingly difficult for people to conceive of reality save in physical terms and ultimately in terms of the fundamental physical sciences. At times men have gone so far as to deny the very existence of the most patent and obvious phenomena, namely, the facts of consciousness, since they have been unable to express such phenomena, first in physiological terms and ultimately in terms of bio-chemistry. In short, the spiral of intellectual dealings with the world seems in some quarters pretty nearly to have come full cycle back to the methods of the scholastics of the later Middle Ages. These men were prone to deny the validity of anything which could not be fitted to the *a priori* assumptions of their theology and metaphysics. Not a few biologists, psychologists, and sociologists in effect similarly deny the reality of anything which cannot be fitted deductively into the patterns of thought which have inductively been built up by the labors of the physical scientists. Not long ago a brilliant young student, whose whole intellectual life had centered about this materialistic core of thought, assimilated an argument I was making by the exclamation, "Oh, I see, you mean it is just an *idea*." To her "ideas" were the

very stuff of which dreams are made, not to say "ideals" — and yet she cherished a good many of both.

Now the whole issue centers on the nature of the adaptive organism. If the latter is reducible to terms of physiology and nothing else, then the case for the materialistic interpretation of life is made out. We need only to wait patiently, in confidence that all our thoughts and sentiments will ultimately be shown to be but electrical or chemical phenomena. In that case, not only is education a delusion, but we ourselves are scarcely delusions even, for delusion implies the reality of conscious self. A mechanism could not even be mistaken about itself. The disclosures of both the surgical clinic and the laboratory, however, during a relatively brief period past, have pointed directly away from the materialistic conception of the behavior of higher animals, and a rich body of field studies, especially on the insects, has pointed in a similar direction, even for some of the lower forms.

I

NATURE AND PURPOSE

We are all of us sufficiently self-conscious to be aware of sensory organs and organs for grasping and moving about and other organs for speech. We have at least a tradition that people have brains, albeit most of us have never seen one. Unless we have familiarized ourselves with comparatively recent discoveries in physiology, we are probably unaware that there are other organs in the body which are very important in enabling us to get along in the world and to get along with ourselves as well. And then we have experiences of sights, sounds, smells, feelings, and thoughts — at least what we suppose to be thoughts.

All this taken together is what we mean by the adaptive organism, and there are in general two outcomes: we can figure out what to do and we can learn how to do it better next time or else learn not to do it at all. In brief, we thus make responses to environmental requirements and within certain ranges become individually adjusted to such requirements by learning. This last clause contains the nib of the matter, for we can restate our survey of organic evolution by saying that evolution is a story of constantly broadening range in the trunk line of the possibility of adjustment in the individual traceable to evolution of a better and better adaptive organism.

Evolution

If we observe some of the lower forms of life, we can see that in effect there is no range of adjustment at all. They float about in the water and whenever food comes their way they fold themselves about it and digestion ensues. There is no problem of courtship, marriage, and divorce, since when it is time for a new generation they cut the Gordian knot and split into two creatures where there was one before.

Higher up, we find creatures who move about and go where food is likely to come their way, but do no hunting for it and have no occasion to become interested in their individual contemporaries of the opposite sex.

In due season, however, we find creatures who indubitably "go after" their food and pursue the opposite sex in the interest of progress. Furthermore, when times get hard and the climate uncomfortable, they go somewhere else.

If we were to examine these creatures, we should find that the adaptive organism is greatly increasing in com-

plexity all the way along, new organs being added, existing organs improving in adaptive capacity, and all organs being better and better harmonized or integrated into working units. The lowest forms have only the beginnings, in protoplasmic irritability. The highest, and some which are very low — notably some of the insects — have capacities which we are, on any reasonable interpretation of the evidence observed in behavior, forced to conclude are not physical but psychical. At least, that is the name which we give the capacities.

Learning

Now all the way up the scale until we reach the mammals, most creatures do not need to learn much, for they seldom find themselves in strange circumstances. Their organisms are capable of fitting response because they are born ready adjusted to pretty much anything they are likely to have to do. We say that they are under the control of instinct. That is one way to put it. Another way is to say that they are in large part mechanisms, so that a given stimulus sets off a customary chain of response reactions.

They do not need to learn much, but they need to learn something and experiment shows that they can and will learn. If not the lowest animals, at least some which are very low — worms, for example — are thus capable of *individual adjustment*: they can learn from experience to meet strange situations. Earthworms, after crawling over sandpaper, will learn to go by another road. They have learned from experience, and even Man never learns in any other way; only his experience is usually vicarious and not direct.

The highest animals below Man are capable of un-

learned adaptive response over a much wider range, and since they are a great deal more likely to find themselves in strange situations they are capable of a wider range of learning. A dog given an egg containing pepper eats no more eggs. Presumably an earthworm would not learn that, but then earthworms never need that kind of discipline.

In Man. The adaptive organism of Man, taken as a whole, is the best of all. His sight is not so acute as that of the eagle, nor his sense of smell so good as that of the dog, nor his musculature to be compared with that of the cat. But, as we have seen, his hand or fore paw is much better, his senses of vision and hearing discriminate better, his muscles are more refined. More than that, his cerebral hemispheres, which are not unlike those of his primate kindred, are much better organs. They are larger and, so to speak, will ring up more stations. Nevertheless, it is a mistake to suppose that the superiority of Man is merely that of the superiority of his adaptive organism. It is infinitely more in the *kind of thing* that his organism makes possible. The kind of thing is something new in the world. Man's superior adaptive system, considered by itself alone, would make him somewhat better than the apes, as different from them, perhaps, as the highest apes are different from the lower primates. But the kind of adjustments which Man can take on are socially available and transmissible from generation to generation. They are cumulative. His artifacts, from chipped stone to the Parthenon, remain behind when the workman passes on and become part of the environment, ready-made experience for other men. His language makes possible, not only the genesis of complex ideas, but the transmission and perpetuation of ideas.

This principle is assuredly one of the major foundation stones in our theory of education and probably the clearest light we have touching the issue of educability. *Man's adaptive capacity, whether in the individual or in the race, depends far more on what has been learned than on the excellence of the adaptive organism itself, far more on personality, the product of learning, than on either mind or brain.*

Experience contrasted with what comes out of experience. Now, even in the case of the worm, experience is not what comes out of experience. Going over sandpaper is different from "No more sandpaper alleys for me." The only terms upon which experience and what comes out of experience could in substance be identified as being the same thing would be in the principle that the experience becomes recorded in the adaptive organism and thus brings about adjustment by modifying the organism. Whether or not that be true is a question of fact, long assumed by some to be true and now definitely disproven. We shall deal with the issue in the next chapter. Vision is organic, but what is seen is no part of the visual apparatus. The *Divine Comedy* is no part of Dante's brain nor of his mind, albeit both were doubtless essential to its production. The *Fifth Symphony* is no more truly the secretion of Beethoven's brain than it is the product of the musical instruments which he could command. Both were conditions essential to the production, but the masterpiece itself was no more the product of either than the beauty of a rose is the muck-heap in which the rose-bush grows.

II

ADAPTIVE PROCESSES

The adaptive organism in animals has been evolving by successive adaptations since animal life first appeared on the planet. In general, *the scheme of evolution has been the appearance of adaptive processes at higher and higher levels as quantitative development has led to conditions under which qualitative changes became possible.* The supreme instance is found in the changes in the primate organism which we have already noted and which established the conditions under which humans and all their works became inevitable. Here as elsewhere evolution seems to have been irreversible; that is to say, an organismic adaptive scheme once established has never been lost, but has rather evolved in the phylogenetic series into higher and higher forms.¹ Certain instances are noted in illustration.

Tropism

If we pass over primitive forms of life in which the adaptive functions seem to be limited to protoplasmic irritability and contractility, a scheme which is by the way still found in Man, the most primitive process is, I suppose, tropism.²

Certain creatures get along in the world merely by moving or growing toward the sources in which energy can best be captured. Thus we see plants turning toward the sun, or heliotropism. Some animals will do much the

¹ See Herrick, C. J., *Brains of Rats and Men*, especially chapters XIV-XIX; Osborn, H. F., *Origin and Evolution of Life*, argument as a whole; J. T. MacCurdy, *Common Principles in Psychology and Physiology*.

² See Jennings, H. S., *Behavior of the Lower Organisms*; Holmes, S. J., *Evolution of Animal Intelligence*.

same; they will move toward the light. Others will move toward the shadows or toward the earth, or will always swim against the current.

In tropistic behavior of this sort it has been shown that mechanical stimulus plus neuro-muscular activity pure and simple is entirely sufficient to account for the behavior. Nothing that we can apprehend as the effect of consciousness is present at all. A swimming, light-seeking form, for instance, turned at an angle to the rays coming from the source will receive disproportionate stimuli on the two sides so that it swims in a short series of zigzagging curves until the stimuli on the two sides balance and progress is in a straight line.

Since much the same sort of thing can be found in the development of neural pathways in the body, various writers have been captivated, and some apparently still are, by the notion that human behavior even can be explained on a purely mechanistic basis without the intervention of psychical activity. The existence of psychic phenomena is explained away by the convenient process of labeling them subjective — “just ideas.

But psychic phenomena cannot be ignored, nor is there any need, nor need we assume that Man exhibits nothing like tropistic behavior and that something has been lost out of the world. Analysis of imaginal and ideational phenomena, especially in such mental processes as attention and recognition, reveals something very like tropism at the mental level. Somewhat as purely physical stimuli bring about movements, now this way, now that, until there is automatic adjustment and the creature moves toward a goal which is objectively a desirable one, so out of an exceedingly varied background of images or ideas first one and then another will reject

itself until the one which is appropriate to an adaptive response — adaptive as distinguished from hit or miss — gets selected.

More than that, *balance* appears in the tropism and is of the essence of the adaptive process. The organism swings now this way, now that, until stimuli coming from the goal balance. It is a far cry from the behavior of a flying insect to the higher forms of intellectual and idealistic behavior and yet this principle of balance appears throughout. In solving a problem or in determining upon a moral course of action, we settle upon what seems to be *valid* in terms of affective equilibrium. In common parlance, we doubt and hesitate until we are *satisfied*.

Chain reflex

Physiology reveals numerous instances in the physical organism of what is known as "chain reflex." We are entirely familiar with simple reflexes such as the knee jerk and the protective reflexes about the eyes. We know that they are purely neuro-muscular, with no semblance whatever of anything psychical or personal about them. But a characteristic of many bodily processes is that they consist in one reflex setting off another in a chain. Swallowing is perhaps the most convenient illustration. The food stimulates a contraction in the gullet, this in turn another, and so on until the food is ingested and the process stops for lack of stimulus.

When this principle reached the consciousness of a certain class of students who were interested in the study of human behavior, they exclaimed once more, "Lo, a scientific basis at last: all is chain reflex." But chain reflex as such will not even begin to explain *outward be-*

havior either in human beings, the mammals in general, or probably in forms that are more primitive than the mammalia, simply because it will not fit phenomena which are exactly as real as those which appear in the observation of the reflexes themselves.

Nevertheless, in chain reflex is a *method* of adaptive response which evolves to higher and higher levels until it appears in our intellectual and volitional life.

Psychologists have long made much of "association" as a term descriptive of certain observable mental processes, and of late much has been made of patterns. An image of an event which has once occurred in experience will occasion the appearance in consciousness of images of other events associated with the original event. An idea which is part of an insight or understanding will tend to appear in conjunction with other ideas which are part of the same meaning. In an analytical reflective thought process, one idea or set of ideas evokes another idea or set of ideas, in a fashion which is very like a reflex chain in the physical organism, but which is not the same thing. One is physical; the other is psychical.

Similarly, just as innumerable neural processes in the physical aspect of the organism get knit together in forms which so baffle our attempts to picture them as successive neural events that the best we can do is to call them patterns, so the imaginal and ideational processes get knit together in complexes which we call patterns.

Conditioned response

The Russian physiologist, Pavlov, demonstrated in experiments on dogs that this sort of thing would happen.

A hungry dog is brought into the presence of food. Being restrained for the moment from devouring it, he

"waters at the mouth" and the saliva is measured. At the same time a bell is rung. After a certain number of such experiences the saliva will flow at the sound of the bell when there is no food in sight. Well, there is nothing new or strange about that. Quite apart from experimental activities, we have all of us "watered at the mouth" at the mere thought of a juicy beefsteak, provided we were hungry.

The process observed is called in English "conditioned response." The physical organismic processes show innumerable instances. In fact, much of our learning, so far as learning is a mere physical activity, seems at bottom to be a matter of conditioned reflexes. The principle can even be used in therapy and the visceral organs "taught," as it were, to mend their ways.

Here again was at last a scientific basis for human behavior — scientific merely because it was physical — and some thought we could proceed to build up not only a theory of education but even a whole philosophy of life on the basis of conditioned responses.

Nevertheless, as so often happens, the Pavlov experiments set people to thinking along new lines, and it presently appeared that the *adaptive method* disclosed at the level of reflex movement could be observed at higher and higher levels until it is found in imaginal and ideational processes. In other words, just as salivation could be conditioned to sound of bell, so an image originally unrelated to an event can be conditioned to an image intimately related to the event, and the two form a complex or pattern. Nevertheless, while the term "conditioned" could properly be applied to sensori-motor responses, it cannot so be applied to the similar adaptive process at the higher level.

Critique. The term is very prone to be misused by writers and by enlightened laymen and the outcome is apt to be a mischievously fatalistic view of life. Writers seem to use conditioning almost synonymously with habit-formation and association, whereas it is nothing of the sort.

The term itself is brought over from metaphysics where the distinction is drawn between absolute and conditioned existence. Thus Deity is looked upon as possessing unconditioned or absolute existence, whereas, as we all know, human beings are conditioned by force of circumstance. We cannot make water run up hill, albeit by attention to the laws of hydraulics we can force it under pressure to move against gravity. We cannot achieve freedom by repealing the multiplication table. We are conditioned in our mode of existence; there is always an "if" in life.

Thus, in Pavlov's dogs, secretion of saliva, a purely physical process, was conditioned by the sound of a bell. Thereafter, their mouths watered indifferently either at direct visual experience of food or at auditory experience of a bell. More than that, in humans at least, an image of the sound of the bell instead of the sound itself will serve the same purpose. There is something beyond personal control here.

Humans frequently get conditioned, sometimes even to the extent that their behavior comes within the legal definition of insanity — it is beyond the control of notions of right and wrong. This is especially true when some of the more powerful appetites are in the picture. The individual will revolt at the behavior beforehand and experience remorse afterward. Nevertheless, perverse behavior will take place.

A good illustration can be seen in typical behavior of alcoholics. This man has what he comprehends as "an appetite for strong drink." He loathes the consequences and is miserably unhappy over his condition. He resolves and resolves again, with entire genuineness and sincerity, and yet he always breaks down on occasion. During a "dry" period in his community, he prospers, is well and happy, and his family reaps the benefits of his abstinence. He says that "he no longer wants it," and in truth he does not. But his town "votes wet" and the saloons open. He passes a saloon on the way to work and promptly falls again. His behavior is fully conditioned by the visual and no doubt olfactory experience of the saloon. They serve the purpose of the sound of the bell with Pavlov's dogs. But he should have practiced self-restraint! Should have learned from experience! So says the individual who has never fallen and who is unenlightened in the ways of conditioned behavior. In the case of our poor friend, both volition and rationalization are shifted toward justification of the perverted behavior — until afterward. Like Rip Van Winkle in the play, he satisfies himself by "not counting this one."

Now of course this is not the only form of alcoholic or otherwise perverted behavior. Some, the majority for all I know, exhibit no conditioned behavior. They want their drink and intend to have it regardless of consequences. For better or for worse, their behavior is no different from what it is when they embark on a business enterprise or go to the theater. So far as perversion is present, it is personal and not organic.

If Pavlov's dogs had been persons and had found it inconvenient to secrete saliva whenever they heard a bell, and if as persons they had been enlightened touching

the organic process at work, they might have solved their problem by avoiding places where bells are likely to be heard.

So with our alcoholic, he might avoid streets where saloons are found. In other words, in ancient common-sense, he could have avoided temptation. But this would be personal and not organic.

Reconditioning. One sometimes sees instances in which the conditioning process is either nipped in the bud or else an established condition is broken up by reverse conditioning. Such, for instance, occurs when the inebriate encounters an experience in the course of his alcoholic behavior which so terrifies or nauseates him that it overrides the original appetite and establishes a new condition. Two noteworthy instances within my own observation were ever afterward extolled as examples of "marvelous will power," which was evidently a misinterpretation.

Sublimation. Again, the likelihood that primitive appetite may serve as the basis of conditioned behavior is very greatly lessened by sublimation of the appetite itself, a process which we shall have occasion to discuss in a later chapter, but which for the present may be defined as raising the level at which satisfaction occurs.

Distinctions in terms. As has been suggested, the enlightenment contributed by the Pavlov experiments has tended to become exaggerated and some writers have seized upon this new term to cover organismic processes which are not properly to be comprehended within the meaning of conditioning.

(1) *Habit-formation.* Habit-formation is *sui generis* and not a conditioning process. Any of one's multitudinous habits, which are properly habits and not conditioned

behavior, can be broken up by personal intervention. One may, for example, follow the same route to his work year after year. He was totally unaware of the habit-formation when the process began and there is even now nothing of the volitional in the behavior. But he becomes aware that there is a better route and determines to follow it. In a few days a new habit has replaced the old one. So with unpleasant habits; attention being called to them they can be broken up by the person himself.

Not so with what are commonly called "bad habits." These are usually not habits at all, but conditioned behavior. "Can" and "will" simply have no meaning here. We have seen how it is with our alcoholic.

(2) *Association or bonding.* Various writers seem to have no further use for the term "association" as employed by the older psychologists since a new term "conditioned" has come along. Now conditioning is evidently an associational process, but by no means is all association conditioning in any accurate use of terms.

For example, I am making a journey over a route which is not as yet familiar; habit patterns have not as yet formed. I am somewhat puzzled at a certain point, but I notice a restaurant at which we lunched the last time and at which the food was good. As images which have accrued from previous journeys contend in consciousness for validation, the image of that luncheon appears in the field. Validation is at once complete. I say, "Hello, here is that lunchroom; I remember now." We journey on in peace.

Nevertheless, my behavior is free, or personal, or unconditioned, behavior. I feel no compulsion to keep on at all. Our unfortunate alcoholic might similarly have

come upon a saloon, with all its seductive imagery. Whether he *could* pass on or not, he *would* not; his behavior would have been *conditioned* in the true use of terms.

Other instances of conditioning. The case of the alcoholic is perhaps as good an illustration as we can find of true conditioning, but others can be adduced.

Mild forms of obsession are sometimes found. Avoiding the cracks between flagstones in the sidewalk when walking, picking up pins, going back to see that the door is locked — these are some instances. They constitute part of the behavior of persons, but they are not personal behavior. They are conditioned responses. There is no peril in stepping on the cracks and the person knows it. He has not even any particular dislike for doing so. And yet he always avoids the cracks. The front door was locked; he knows it was locked; and yet he will go back once. Such obsessions can of course become serious obstacles to normal living.

In education. So far from education being a matter of organizing conditioned responses, it is exactly the opposite. If any such thing were possible — and we may thank Heaven it is not — the result would be personal nullity, an individual controlled by inescapable preorganized behavior. Quite the contrary, one of the objectives of sound upbringing and instruction is to forestall and prevent the conditioning process.

Trial-and-error

A fourth illustration of the principle, that primitive adaptive processes appear at higher levels as other processes which are qualitatively different and yet manifestations of the same adaptive method, is found in trial-and-error.

Far down in the scale of animal behavior, we find that creatures confronted with an obstacle will try devious methods of getting around it. Sooner or later they hit on the right expedient. Repetition of the experience in due season results in learning which is, however, not personal learning; that is to say so long as it is that particular obstacle that recurs, they henceforth surmount it without hesitation. They learn the adaptive response, but they undergo no adaptive change.

Confronted by a new kind of obstacle the process goes on all over again, and so they proceed through life. They cannot live in any sort of complex existence for the simple reason that they could not learn rapidly enough. Their *adaptive capacity* is small, albeit some of them, the birds for instance, are biologically adjusted to a wide geographical range. With certain exceptions noted under unlearned behavior in Chapter VI, none of them can interpret a novel situation beforehand, although some of the higher primates seem to show glimmerings of that kind of capacity.

In Man, however, while the same adaptive method is evident, it appears at a higher level, such that novel situations can be interpreted. The critical process is called "constructive imagination." In this way:

A dog shut out from the living-room and secluded in the kitchen will make random movements seeking restoration to the family circle. For a time he will whine and scratch at the door. No good. Then he will circle the room and run through an open door leading perhaps to the basement. No access there. He returns to scratch some more and brings down on his head the wrath of his mistress. Gives it up for a time. Eventually he pushes open a swinging door into a passage, quests about that

passage, follows up the back stairs, runs about until he comes to the front stairs, down them, across the front hall and into the living-room, where he makes himself as inconspicuous as possible. In due season he is noted, and his mistress exclaims, "Why, here is Buddy. How did he get here? I shut him into the kitchen. Buddy, however did you get here?" Buddy is not giving himself away. Then the ancient debate is reopened: can animals reason? Next time, or at least sooner or later, the dog does it all over again, and in due season does it regularly. He made a trial-and-error adaptive response and eventually learned the response to that particular situation.

Now a half-grown child would have done exactly the same thing at a higher level. Instead of running about at random, he would have *reflected*, which means that a series of images of himself doing much as the dog had done would run through the focus of consciousness until a pattern would check as valid. "Why, yes, of course." Goes and does it.

Later on, the child will have progressed so far on the road to civilization that he will have taken on a good many generalized patterns which, in the long process of social trial-and-error, have survived in the form of abstract principles and he can think his way through immensely complicated situations.

Adaptive capacity

For many years — centuries, I suppose — students have been fascinated and puzzled by the concept "intelligence." Of late, the subject has been dealt with in critical studies in which an effort has been made to reduce intelligence to mathematical treatment, and yet the authors themselves in all sincerity are often reduced to

the expedient of putting the word in quotation marks with the qualification "or whatever it is that we are measuring." Now here is, as it seems to me, a confusion in terminology; people try to use the same term to cover a concept which proves on analysis to be reducible to two different concepts.

In common usage, in the vernacular, we know well enough what we mean. We have in mind ability to interpret a novel situation in a cultural complex — getting an automobile out of the ditch, perhaps — and to behave effectively in its presence. We contrast intelligent behavior with mere empirical trial-and-error. And so we speak indiscriminately of the intelligence of a clever dog, and the intelligent compounding of a prescription, let us say. We are inclined to conclude that intelligence is "born in" the individual and that is the end of it. Nevertheless, if we stop to think we can hardly fail to see that we are dealing with two different kinds of things.

In the case of the dog we mean either that he is unusually apt in puzzling out a situation — likely enough we overestimate his behavior, for most of us like dogs — or else that he is apt to learn. In the case of the pharmacist, we know that the intelligence of his behavior is the product of a long course of education. We admit that those of us who have no sort of understanding of the principles of medicine, chemistry, and pharmacology would be objectively as helpless as the dog in the presence of a need for drugs. In truth, practically all of us do have some sort of understanding, but civilized people prefer to trust the medical man and his pharmacist. That also have we learned.

When one of Köhler's apes not only uses a stick to reach for food, but likewise fits two sticks together by

chamfering down the end of one with his teeth and fitting it into a hole in the end of the other, we say that here is behavior which is characteristic of humans. We once saw the monkey of a hand-organ man descend from his perch, hunt for a suitable stone, and shy it at an annoying dog. Incidentally, that dog's whole cosmos fell in ruins about his feet and he removed himself precipitately to less bewildering regions.

The behavior of both these primates was indeed characteristically human behavior, so far as capacity of the adaptive organism is concerned. Feral Man would very likely have done not much better. It required many millenniums for social Man to accumulate enough culture to make his behavior very much better than that of the best apes, despite his vastly better and more elaborate organism. Both the ape and the monkey were unusually *clever* or *bright* individuals of their respective species. Other individuals were relatively *stupid*. These bright ones could not only "put two and two together" better, but they could learn more and do it more readily. Nevertheless, the ape could not in case of necessity have dressed the two sticks to dimension, bored one and turned a taper on the other in a lathe; nor could the monkey have equipped himself with a handy bow-and-arrow or automatic pistol in order to repel dogs. These things require learning of the order of which Man is capable; they require cultural accumulation and *personal* learning.

Herein, I think, is the key to our issue. Pinning our faith to what we can reasonably well make out of the process of evolution and out of the observed behavior of animals up to and including Man, eschewing unwarranted assumption and mere unsupported conjecture, and refusing to beg the question, two clear concepts emerge:

organic adaptive capacity, and *personal adaptive capacity*. And here is the root significance of the word "intelligence." The verb *intellegerere* meant: *a*, To perceive, understand, comprehend; *b*, in particular, to have an accurate knowledge of or skill in a thing, to be a connoisseur. The vernacular expressions for organic adaptive capacity are "clever," "bright," "acute" and "stupid" or "dull"; for personal capacity the common terms are "intelligent" or "accomplished." A stupid man may well be intelligent and an acute individual may be altogether lacking in intelligence. Our pharmacist is intelligent in the compounding of prescriptions, albeit it may have taken him a long time to learn. If he had been critically defective in organic capacity, he could not have learned to compound them at all. Thus intelligence is dependent upon what has been learned — that is to say, upon personal adjustment; organic capacity upon the quality of the adaptive organism. Intelligence is an educational product pure and simple; organic capacity is utterly beyond the reach of the educational process.

It will doubtless be objected that this is not the common meaning of "intelligence." That is unhappily true. But common usage, as we have seen, covers two sets of concepts which are essentially unlike. Here is one of the numerous instances in which common usage will not do for scientific purposes. In such cases either we must seek new terms like "erg" or "gene," which are so strange that they are not likely to fall into the morass of common usage, or else resort to the root and original meaning of a word which is already in common usage and is further still commonly employed in its correct significance as well as in another and incorrect connotation.

But intelligence is not all of personal adaptive capacity.

Other and even more critical aspects are found in *appreciation* and in *language*, and these we shall presently study.

III

ADAPTIVE RESPONSE AND ADAPTIVE CHANGE

Education is not learning what to do, but becoming the kind of person who knows what to do.

The amœba brought in contact with a particle of food folds it in and absorbs it. That is an exceedingly low order of adaptive response, but the creature is not changed; there is no adaptation.

By and by one-celled animals become changed into many-celled animals. A series of adaptations has taken place, by process of variation and survival. The new animals are capable of a much greater range of adaptive responses, because the adaptive organism has improved under organic evolution. But they cannot for a long time learn much.

A cat starts to cross the street in front of my house, sees an automobile bearing down on him, and gives his feet wings. That is adaptive response at a much higher level than was the amœba's ingestion of food. This cat never crosses the street again. To him automobiles have gone far to take the romance out of life, but after all life is better than romance. An adaptive change has taken place. He has learned something. Here adaptation is not by variation and survival, but by learning. If there were a cultural element in it, we should call the learning a personal adaptation. But another cat keeps on doing the same thing day after day until the inevitable happens, and we have to gather up the remains. He is a veritable Bourbon among cats. He makes a great many adaptive responses

and becomes skillful in doing so, but no adaptation takes place. Like his royal prototypes, he learns nothing.

I am absorbed in writing and hear the clock strike. I lay aside paper and pen, seize my book-bag, and hasten to the classroom. That is an adaptive response. I did not learn it. What I did learn was in the form of a whole series of personal adaptations, which I suppose to have been cultural, which at all events have resulted in my holding a place as a teacher. Having learned, I make all sorts of more or less appropriate responses. My adaptive organism is good enough for that. I could not have learned the responses — too many of them would have been required — but I could have memorized some of them. In that case, however, the bond “ten-o’clock-class meeting” would have sent me to classes on days when the administration has declared a holiday, unless indeed the President called up and said, “Now, there will be no classes tomorrow, and you do not have to lecture. Is that entirely clear?” Now and then an unfortunate colleague tries to lecture on Sunday or appears in class in his smoking jacket. The students are amused and rightly conclude “absent-minded professor.” He is certainly as highly developed as I, but for the time being the mental side of his adaptive organism is switched off and he does queer things; he does not make the correct adaptive responses.

In education. Now, the distinction between adaptation and adaptive response is of profound significance in education. The correct adaptive responses to numerous situations can be drilled home so that the pupil’s behavior looks to be normal, and thereafter his adult behavior. Since human beings have superbly complex nervous systems, an incredible number of these bonds can be established, but sooner or later the system breaks down

and society pays the price. Sometimes the individual pays the price, now and then in curious ways, one type of which can be noted in passing, although we shall need to come back to the illustration in other connections.

These adaptive-response bonds are of necessity physical in character. Sensory stimulus—cortical co-ordination (something like the action of an automatic switchboard at the telephone office)—activation of performed behavior. Doubtless mental images play a part and in the event the process is transferred to a higher level, but still neural patterns are apparently the base of operations. Now, if something happens to the brain through poisoning, mechanical injury or some malady, interesting things happen. Occasionally a patient is found whose behavior is utterly different from and immeasurably worse than that of other patients suffering from precisely the same malady. The reasonable explanation is that the whole life of such people is made up of adaptive responses and with a paucity of adaptations. They have learned what to do, but have failed to become the kind of people who know what to do. Anything that interferes with the neural organism abolishes the system of adaptive responses upon which they rest and they revert to the level at which there was actual learning in the form of true adaptations, often at the childish level. Most cases of paresis show this characteristic, but not all; now and then a brain tumor case; many cases of senile decay, but by no means all.

Lesson-learning. I have dealt with one aspect of the problem factually in another work.¹ There I have re-

¹ *Practice of Teaching in the Secondary School*, chapters III and IV. The factual material itself is presented in the first edition of this work and summarized in the second edition.

ferred to the phenomenon which appears in ordinary class teaching as lesson-learning. So far as my own studies and those of my students go, I think that the proportion of pupils who consistently exhibit true learning of school subjects in the form of personal adaptations probably runs at not much above ten per cent, and that is not very far from chance expectation.

Now this is not to say that ninety per cent of all people exhibit the *spurious* type of personality. In the first place, even in the school learnings, chance operates about as much in favor of some kind of true learning as against it, and so we seem to find only about the same percentage of out-and-out lesson-learners as of true learners. The remainder fall betwixt and between. In the second place, out-of-school learning, especially among people who have to make their own way in the world, tends to result in true learning products—that is to say, personal adaptations—albeit some of them may be perverse rather than spurious.

Even the confirmed lesson-learner, or spurious personality, takes on personal adaptations, but they are likely to be perverse. The most conspicuous is a structural learning which we have called the “get-by attitude.” The pupil aims at the passing grade and nothing more. The adult is a childish conformist and he is prone to compensate by decrying conformity. He is willing to use language which sounds as if it meant something, but does not. He does right only from fear of the consequences of doing wrong. He is an imitator, a copyist. His whole life is molded by the passing whims of style and circumstance. In the trivial affairs of social intercourse, he or she can never decide what to wear to a party. Such people “look it up” and then worry if the event shows that they

decided wrong. In university life the spurious student "takes a course" in order to be able to read a book which he ought to be able to read without any "course." Having taken the courses and acquired a degree, he says, "Guess I ought to know; I have the degree *and I worked for it.*" Patent disclosure of his ignorance makes no impression on him; he has taken the course, got by, and therefore he must know. In short, such people live in civilization, but are not of it.

IV

UNITY OF THE ORGANISM

We should probably be saved a great deal of confusion if, after having made up our minds to avoid trying to reduce everything to physical terms—at least in anticipation of evidence that we must do so—we would take the further step of refusing to allow ourselves to think of the physical and psychical aspects of the adaptive organism as being in reality separable parts, after the analogy of separability as between stomach and brain, for instance. Psychologists have been diligent for many years in insisting on the confusion which arises from that kind of fallacy. The faculty theory of psychical life, long ago exploded, was an instance of the tendency to set up compartments or separable organs. But an erroneous concept once established persists in related forms for a long time.

In truth, the organism is a unity; it works together as a whole. We can properly speak of the two different *aspects*, for aspect means "a way of looking at," but not of a physical *part* and a psychical *part*. Science has made a great deal of progress in explaining how physical *processes* work and a great deal in explaining psychical *processes*,

but progress has been very halting in explaining how the two are related, almost entirely because the attempt has usually been to explain psychical processes in terms of physical processes. In recent years the more advanced physiologists, psychologists, and especially psychopathologists, have learned to co-operate, and stop begging the question, by investigating the adaptive organism as a whole without prejudice as to what is physical and what is psychical. Naturally, a good deal of progress has already been made.

Locating the "mind"

Persistent confusion and perplexity have further arisen from the centuries-old attempt to locate the mind in some bodily organ and, I suppose, from the feeling that the mind must be located physically somewhere. In ancient times, different visceral organs were pitched upon. As soon as anatomical studies had disclosed mysterious glands, some thought that the pineal body must be the "seat of the mind." The popular notion today is that the brain is the seat of the mind and better still the frontal lobes.

Now one location is about as good as the other. The reason for "locating" the mind in the brain is not fundamentally better than the reason for locating it in the heart or the liver, as some of the ancients thought, for the simple reason that it is absurd to try to locate it anywhere. It is much the same as it is with energy in the physical world. He would be an unimaginative physicist indeed who could form no conception of energy apart from a steam engine or electric generator.

The mind not an organ

Perhaps the first confident step we should take is to exclude the notion of mind as a separable organ after the analogy of the physical organs with which we are familiar. We can be sure of mental processes, and psychical processes in general of which mental processes are but one category. We can study in the laboratory the phenomena which they yield and find that the latter hold together in reasonable relationships much as do the phenomena which we study in other laboratories. So far we can cultivate scientific patience and restraint.

For the student of education, one of the first advantages lies in the fact that we shall cease thinking about "educating the mind," not to say the brain. When we have once taken that step, we shall find the pathway to a comprehensible theory of instruction in general and of the curriculum in particular a good deal clearer.

Another advantage, fraught with the eradication of almost incalculable injustice to the individual and with a decidedly more optimistic view of social possibilities, is in abandonment of such notions as the "child mind," "mental age," and "types of mind."

As soon as infancy is left behind, what are definitively mental processes in the child are not essentially different from those of the adult; and there is but one "type of mind," although mental processes may be more acute in some than in others, and "temperament" may incline the individual toward one course rather than another. Confusion here in the past has been very largely a matter of terminology, of failing to distinguish between mental processes and the influence of developing personality on behavior.

Common processes

As we have seen, there has arisen a recent scientific tendency to study the adaptive organism as a whole and without prejudice. At bottom such study is the study of behavior from the lowest animals to man, and indeed with some excursions over into the vegetable kingdom.

Thus, a prodigious amount of work has been done in the study of the nervous system and its relation to other physiological structures and functions. Students have gone farther and studied without preconceptions the behavior of both lower animals and humans in the presence of known interference in the nervous system. Of course, the lower animals are available for experimental purposes, whereas human beings are not, save as malady of one sort or another has furnished empirical data.

Physiologists have studied behavior in its relationship to visceral functions ranging from what hunger really is at bottom to the influence of the glands of internal secretion, not only on physical development, but also on mental and emotional processes.

Psychologists have been diligently at work in laboratory study, particularly of such mental processes as sensation and perception.

Psychopathologists have observed abnormal behavior for the sake of seeing what they can make of it all in relation to normal behavior.

Admittedly the outcome is far from clear, admittedly some investigators are prone to explain all behavior in terms of their own studies, and admittedly the whole field is one in which it is singularly hard to steer clear of mysticism. On the other hand, the studies have gone far to reveal that earlier conclusions were little better than

sheer assumption, or asserting that what might conceivably be true is in fact true.

While we shall look into the evidence somewhat more fully in the chapters which are to follow, I think we can say that the comprehensive finding is that the organism is a unity which presents two aspects; that two sets of phenomena appear, one of which we call physical and the other psychical; that the connection between the two is still an enigma; and finally that we do not know that there is any intellectual necessity for finding a dynamic connection between the two any more than there is of trying to find a functional relationship between the obverse and reverse sides of a coin. Behavior may be recognizably physical in origin and yet exhibit psychical phenomena; or it may be psychical in origin and reveal physical reactions.

For example, an illustration noted by MacCurdy, the attraction between a man and a woman in love is no doubt physical in origin, in the appetites which are based on the reproductive function. At least there would not be that kind of attraction if there were no such thing as physical sex. Nevertheless, as we know very well, attraction appears in personality in what we know as romantic love, and romantic love is no more physical sex than the color of a flower is the ether waves which are the circumstances under which the color appears. Furthermore, love persists when the twain are separated, when one or the other is dead, even when the sex organs of both have atrophied with age.

Again, one suddenly comes upon a precipice or other high place and his physical organism is greatly excited. The heart is accelerated; respiration grows more rapid; the body hairs are erected — and I know not what all.

There is an experience of terror, an emotional content in consciousness, a psychical phenomenon. Now reverse the situation. One is lying peacefully in bed in the reverie which precedes sleep and a vagrant image of a possible high-place experience finds its way into consciousness. The same, or much the same, physical phenomena appear which would appear had the individual stumbled to the edge of a twenty-story building.

V

PHYSICAL, PSYCHICAL, PERSONAL

Mind and body

Since men first began to speculate about themselves, they have felt a distinction between reactions which are obviously physical in character and other reactions which are no less obviously non-physical. To review the history of thinking about this problem would be pretty nearly to write the history of philosophy down to date. And yet as students of education the problem can be stated for us in terms which are simple enough for our purposes, if we will only clear out the obfuscations which come from two sources.

In the first place, we ought to confine our attention to what is known or at least fairly well made out, and firmly exclude a great deal which is sheer neurological conjecture, but which little by little has come to be taken for granted.

In the second place, we ought to exclude the dogma that reality can be apprehended only in the terms of current physics and chemistry. This is a hard task, indeed, for we are all of us such confirmed intellectual materialists that concepts which are other than mechanistic in their nature form with difficulty if at all.

Perhaps a commonplace piece of behavior will serve as a starting-point.

I am driving on the city streets. At an intersection a red light blazes out and I stop. If it had been green, I should have kept on.

Now, in the first place, there is a physical phenomenon. Certain wave lengths in the medium through which light is transmitted occur. They have nothing whatever to do with redness. Objectively, they are simply vibrations in the ether; only that and nothing more. There is nothing organic about them.

These vibration rays impinge on the retina and set up processes in my bodily organism. Observe, test, and experiment as you will, there is no redness yet. The neural processes may be chemical in their nature; perhaps they are electrical; at all events, they do not occur outside a living body.

But redness does actually occur, no matter how or why it occurs. Furthermore, I note that other drivers behave as I do. Presumably there is redness in their experience too. Redness is evidently not physical, but since other people behave as if they also saw it, the experience is no doubt real; it is not an hallucination. It is as objective as the light waves and the neural processes. It is not physical but psychical—in this case mental. These are the names we give to the experience.

Now, since I am usually in a hurry when I use an automobile, very likely the red light irritates me. The wave lengths exhibit no marks of anything like what we call irritation. The neural processes seem to, but our friend the physiologist says, "No, that is not it; some of your glands are stirred up." And yet the glands, properly speaking, do not seem to be irritated; at least you cannot

say that they are angry. They are pouring out more of certain kinds of chemicals than they usually do, and that seems to be about all. Still I wish that light would change. There is another psychical event in the world, in this case an affective experience.

But why stop for a red light? The wave length does not actuate the throttle and brakes on the car — at least not on my car. Nor do my nerves. Nor do my glands throw in the clutch and open the throttle. Indeed, some of my neighbors do not stop at all. It is *I* that stop. But something must have happened to me that has not happened to my lawless neighbor. I have become the kind of person who stops when traffic lights are against me. I learned that. This is done and that is not done. So it seems good to me. I prefer it that way. So in this whole behavior complex which looks so simple and which in fact is unitary, there is a *personal* element as well as *physical* and *psychical* elements.

But I must not be smug about my neighbor who runs through traffic lights. He may be an individual of the best of intentions, but color-blind. Personally, he is sound, but he has a defect in his adaptive organism. In him, there are the personal adaptations which are appropriate to civilized existence, so far as street traffic is concerned, but his adaptive system is inadequate for the appropriate adaptive responses. On the other hand, he may be so constituted that he could never learn to stop. In that case, his organism is so defective that adequate personality could not emerge; personal adaptations would not form. Perhaps he has been trained to make the necessary adaptive responses on his regular route, as horses sometimes become trained, but, placed in a strange city in which the rules are somewhat different, he is lost.

Nevertheless, most people who disobey traffic ordinances are sound physically and psychically, but personally inadequate.

Let us see what we can make out of another situation, somewhat more complex and somewhat higher on the scale of living.

I once had a bed of beautiful roses in my garden, a delight to me and to my friends. They were a beautiful deep red in color and the fragrance was a joy. Was the situation purely physical in character, explainable in terms of light rays and chemical processes within our bodies? Maybe, but let us see.

How about the rosebush itself? Merely a plant, explainable as a set of chemical and physiological processes. True enough. Viewed as a rosebush pure and simple, it is completely explainable in that way. There were precursors of the rose in the world before there were people to enjoy them. And yet here are color and fragrance in the world, in a word, beauty, and these phenomena are as real as the plant itself. They are felt, but again they are not hallucinations.

Now if we trace out the experience as we did with the red light, beginning with the blooms themselves, we shall find much the same story: light rays of different wave lengths and particles of a chemical substance given off, peripheral and central neural processes, and nothing that we could call beauty at all.

Judging from his behavior, my dog has no experience of beauty, and yet I know that there is vision in his case, and smell. The children, many of them, exhibit no particular interest. Some of my neighbors do not. Those of us who do experience what we call beauty had to become the kind of people who like roses, and yet it is not

roses we like, but the visual and olfactory experiences which come from roses. In other words, there is a personal element as well as physical and psychical elements in the situation. We sometimes call this kind of personal element a sentiment or value attitude.

And so we arrive at the critical distinction to which this chapter has been devoted, that distinction between the adaptive organism itself and the adaptive product which appears in the world as the result of organismic activity. That product we call personality. We shall need later to devote some time to the study of personality as itself an organism. Meantime the sense in which we shall use the term is perhaps for the present clear.

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CHAPTER V

PHYSIOLOGICAL ASPECT OF THE ADAPTIVE ORGANISM

IN THIS chapter we propose to study more specifically that aspect of the adaptive organism with which the science of physiology is concerned. We ought, however, to bear in mind that we are thus merely turning our attention to one aspect of the organism. As we have seen, we get misled badly if we allow ourselves to think of the organism as being made up of two separable parts which function separately.

One is helped a good deal if he keeps his attention oriented by approaching all of the study with which we are concerned in this chapter, and in those which respectively precede and follow, *from the evolutionary point of view* and is constantly raising the question, What is the function of this or that in the grand scheme of affairs? Where did it originate and what is its primary use?

I

PHYSIOLOGICAL FUNCTIONS, ORGANS, AND PROCESSES

So it is best to look upon the organism with which we are all familiar as exemplified in our bodies as being one which functions (1) as a means of survival; (2) as a means of renewal of the species; and (3) as a means of efficient adaptive behavior.

Survival

By "survival" I mean physiological survival or survival of the body as a going concern. In a wider sense,

the psychical processes are as truly involved in the survival of the individual and the perpetuation of the species as are the physical processes. Nevertheless, perception is not eating, nor judgment the circulation of the blood, nor emotion the physiology of the endocrine glands, nor neuro-muscular response all of learning.

With the physiological processes of existence and survival, we have little to do beyond reminding ourselves that they exist and that they have an evolutionary function. That we are fearfully and wonderfully made in order that life may endure is the statement of a venerable observation. The light shed by advancing positive science gives us little reason to think that the statement is an exaggeration. Professor Cannon's recent book entitled the *Wisdom of the Body* is not only an enlightening but a fascinating exposition of the marvelously balanced processes and guaranties under which physical life goes on.

Still, taken all in all, physiological survival in Man is not different from what it is in mammals in general, and it has not much import in our study of the process which we call education.

Reproduction

Nor are we particularly concerned with the organs and processes of physiological reproduction. Vastly important psychical processes are grounded in them and the products in personality which arise are critical of both individual and social well-being. But in the physiology of the organs themselves we are but little interested.

Adaptive behavior

In the physiology of adaptive behavior, however, we

are deeply interested, for it comes close to the heart of our understanding of the educational process.

We have to move about in the world, in one way or another to defend ourselves, to make constant use of tools and appliances of one sort or another, and we have to talk — or at least we think we do. All these are physical functions and they involve physiological organs and processes.

As *functions* we have means of making contact with the external world, of locomotion and bodily reactions in general, of communication with other members of our race, and of calling up our reserves for emergency action.

There are involved *organs* which serve as receptors, transformers, effectors, and energizers, but it is far better, for our limited purposes, to ignore the *organs* and concentrate on the *processes* of stimulation, integration, motor response, and chemical reinforcement. The reason is twofold.

In the first place, in our vocation we are not called upon for the medical and surgical treatment of bodily organs.

In the second place, and far more important, we are inevitably misled when we try to identify organ and process. If, for instance, we speak of the eye as the organ of vision we speak truth; that is what the eye is for. Nevertheless, the process of vision involves far more than the eye, even if we do not go beyond the domain of physiology. If we do go beyond that realm, we find that vision is a psychical as well as a physical process, and that it is affected by personality. That is to say, what one sees is determined not only by the physical and psychical processes themselves, but also by what one has seen before and by what one has come to be in point of volition, intelligence, and taste.

So it is with other adaptive processes. They do not inhere in any particular organ, but in the organism as a whole, albeit in each of them some particular organ may be of prime importance.

Stimulation. So far as we can make out, even the lowest forms of life exhibit phenomena which we account for as the result of what we call "stimulation." That is to say, they respond to influences coming in from the external world and, in the higher forms, from within their own bodies as well. Their responses are in general adaptive; that is to say, responses have as their function "fitting" the organism to current environmental circumstance.

Now, as we have seen in the preceding chapter, one of the most striking things about organismic evolution is that adaptive processes operate under the same general method at higher and higher levels until we find that psychical processes, which are utterly unlike physical processes in their manifestations, are nevertheless at bottom the same kind of thing so far as function and method are concerned. So it is with the process of stimulation.

In the lowest one-celled animals it apparently rests on mere protoplasmic irritability. The *amœba* in contact with a bit of foreign substance is stimulated. Nevertheless, it is stimulated adaptively and not "just stimulated." It does not merely quiver all over; it folds about the morsel if the latter is food and the food becomes more *amœba*. And what is done in the *amœba* is at bottom done all the way up the scale; only the animal becomes vastly better organized for the doing.

The *amœba* is limited to stimulation by immediate contact; so are other much higher forms farther up the scale. In due season, however, specialized organs appear

which not only greatly broaden the range of the source of stimuli, but also make the adaptive response much more critical. What physiologists call the distance receptors, the eye and the ear, make possible the processes of vision and hearing. The creature can now see his food and perhaps hear it "making a noise like a rabbit." More than that, taste, touch, smell, and stimuli from the muscles, joints, and internal organs appear, and these enhance adaptive discrimination. The situation is no longer merely food and non-food, but in addition good food and food that is not so good, non-food and non-food that is positively bad. Still more, the new processes taken together make possible experience and therefore learning and the beginnings of the psychical forms of adaptive response. The newer creatures become capable of passion. Finally, the new processes come to be usable for something more than getting food and avoidance of becoming food.

Motor response. Amœba does not get about much. Judging from automobiles and airplanes and all that lies between these and the stay-at-home proclivities of amœba, evolution attaches a good deal of importance to getting-about. Not much use in specialized organs for stimulation if you cannot connect with food seen or heard at a distance or get away from what is more or less a menace to survival.

Hence the exceedingly intricate apparatus which is elaborated to take care of enhanced and developed stimulation is matched by other intricate and elaborate apparatus to take care of walking, running, grasping, eating, trunk movements, vocal outcries; and also movements designed to adapt hearing and vision to maximum intensity and efficiency. All this means that the primitive

protoplasmic irritability of the unicellular creatures has developed and become specialized in nerve tissue and muscle tissue. Experience can now come from muscular and visceral action within the organism as well as from external sources.

Integration. But the organism has to act as a unit, an integer. If a visual stimulus coming in merely made one leg jerk convulsively and perhaps the trunk twist about, the creature could hardly do much business. Some process is needed to make the organism work as a unit and furthermore to make its motor and sensory processes harmonize with those which are concerned with physiological survival. There is a great advantage in such a process, and whenever there is an actual advantage in the going on of life, organismic processes appear in the world, be they never so complicated and in their details incomprehensible in the present state of our knowledge.

Now the nervous system is par excellence the integrative organism, but, it should be remembered, the nervous system is not the whole story. There are sundry chemical processes within the viscera which are also concerned in the process of integration as a whole.

Chemical reinforcement. The functions which are discharged by the living body operate within the field which is the province of the fundamental physical sciences. There is more to it than that, for the chemical processes particularly do not appear outside of living bodies. Hence *bio-chemistry*. Nevertheless, our bodily existence is within the field covered by the notion of energy and especially within that covered by the notion of wasting and repair.

Within the multitude of adaptive responses which are constantly going on there is range from no response at

all, or mere vegetative existence, to furious activity. To put it in other terms, there is range from slow wasting and small energy requirement to rapid wasting and large transformations from the potential energy of unstable chemical compound to the kinetic energy of muscular exertion.

Now, if life went on at the same rate regardless of circumstances, either the body would waste rapidly away or else the first emergency would find it entirely inadequate. That is the way we are put together.

Hence, such an emergency as escape from a menace to life and limb, or such as combat with an animal or another member of our own species, calls forth reserves to supply energy and to conserve tissue and rapidly repair it. It further diverts energy from organic processes where for the moment it can be spared to processes in which it is critically needed.

The glandular organism, including both glands themselves and the actuating and integrating neural processes, stimulates an excess supply of sugar from the liver and pours into the blood stream hormones, or chemical "arousers," which facilitate the transformation of liver sugar into a sugar which is more readily oxidized and which thus makes available great reserves of energy. Blood pressure is lowered in regions where a copious blood supply is suddenly required and blood flows away from regions from which it can for the moment be spared. The blood is needed in the limbs and about nerve trunks both as a conveyer of energy-yielding chemicals and as a source of supply for rapid repair of tissue. The eyes dilate, the ears are adjusted, the thresholds of stimulation of all the senses are lowered. The hair bristles, the teeth are bared, the face is contorted, and various postural

gestures occur, all of which have, or have had in our animal ancestry, an adaptive import, either for the purpose of vigilance or for that of striking terror into the enemy. In short, the undeliberate preparation of the body for combat is singularly like that of the conscious and intelligent preparation of a military unit, whether on land or on the sea.

Since the functions with which reinforcing and energizing processes are concerned are those which are and always have been of primary importance in carrying on the fundamental survival process, it is not surprising that higher-level psychical processes of the same general character should also be of fundamental importance in the life of the individual and that the self should express itself fundamentally in these higher-level processes or *feelings*. Evolution could never go on and we could never have become what we are, save as all forms of life would struggle for survival and for the perpetuation of their kind. The higher forms would do neither of these things save for "feeling." The whole body of recent research and interpretation makes it look as if even the highest intellectual processes were based on feeling and essentially on feelings which are a part of the great scheme of reinforcement and energization for survival of the self. Recognition, meaning, judgment are apparently in the last analysis validated through feelings of the integrity of self, through the process of affective equilibration which we call "satisfaction." Half comprehended, this is misleading doctrine, largely perhaps because we are prone to forget that self is constantly expanding as personalization goes on and what would be satisfaction at a lower level of personality would be felt as little less than an affront to the self at higher levels. We need further

to keep in mind that, while the *method* of organismic functioning seems at bottom the same from the lowest forms of life to the highest, the *level* at which fundamental method appears has always been in process of being raised until the highest level is reached in personality. Even so, the process of elevation still goes on as personality in the individual develops. We shall frequently recur to the principle.

II

THE NERVOUS SYSTEM

As we have seen, the function of the nervous system is fundamentally that of bodily integration and as such it is the supreme manifestation of physiological organism. But integration must be understood in a broader sense than that of simple harmonization, for it includes not merely harmonious working of bodily organs under circumstances as they are at any given moment, but also the speeding-up of processes and the calling into action of reserve processes. Nevertheless, the organism has its limits, and the individual in a complex society may easily fall into situations which the organism either cannot meet or else the meeting of which will cause the organism as a whole to break down. Hence the all-too-familiar phenomena of nervous and mental disease. As we shall see, one of the prime uses of civilization is to raise the level of social functioning to the point at which advantageous complexity can be carried and perverse complexity prevented. Education in the individual has not been achieved unless mental health so-called is the outcome, making due allowance, of course, for purely organic disease.

Misconceptions. Now there would be little occasion for

this section were it not for profound misconceptions touching the nature and function of the nervous system as a whole. Even so, as students of education, we should cherish but an academic interest in such misconceptions were it not for the fact that they have a powerful tendency to pervert our underlying theory of education itself.

Among these are notably those which hold that we "think with our brains" and that all learning-products are neural patterns. Along with these go the notions that we "educate" our brains and our nervous systems. There has grown up in the last three centuries a veritable brain mythology, manifested in such expressions as "people of brains," "brain power," "put your brain to work." Periodically there reappears the ancient folly which holds that "The brain secretes thought as the liver secretes bile," just as great physics laboratories still receive every year new projects for perpetual motion. Brains of great men have been weighed and their cubic measure determined; so have brains of criminals and peasants. Brain food has been advertised. People worry themselves sick over the "condition of their brains." Some are convinced that they are of superior clay because they have big heads and are saddened by the world's neglect of genius; others are fatalistic because "their brains are no good," and some excuse themselves from exertion for the same reason. Time was when distinguished men bequeathed their brains to science, but it is noteworthy that this practice has largely gone out of vogue, either because scientific men are less interested in the value of their own identity, or else, more likely, because they have become disillusioned under the advancement of knowledge.

In attacking this whole issue, perhaps it is best at first to survey some of the more recent scientific materials.

TREATISES

First of all, let us call to mind the positions taken by two great classics in the field of physiology, works which rise above mere grubbing about in the field of empiricism and reason out the broader significance of the findings of the authors and of other scientific men.

The first of these is Sherrington's *Integrative Action of the Nervous System*, 1906.

The title itself is the summation of the findings of the author. Professor Sherrington reveals integration as being the meaning and significance of the nervous system as a whole and of course the brain as the supreme integrating center. Even so, the brain is but the dominating center, for there are many other kindred centers scattered throughout the body. Thus, myriads upon myriads of nerve fibers and nerve trunks, and two interconnected divisions of the nervous system, the central and the autonomic, connect up every muscle, every sensory organ, every gland, and indeed every organ in the body, directly or indirectly, with every other muscle or organ, or at least make possible such connection.

The whole system has been likened to a telephone system, and the analogy is attractive but incomplete. It would be more nearly complete if a telephone system were also a system for the control of electric power, and automatic systems give us a better analogy than do those in which operatives sit at switchboards and "plug in." The brain is by analogy the main switchboard in a large city. The telephone system is one of our principal instrumentalities for integrating the activities of a community; nevertheless, what it can do is but a pale picture of what the nervous system can do. In our daily use of the telephone, we integrate the immediate neighborhood

for most purposes through our local exchange and inter-exchange integrations become more and more extensive. But if we need to bring a distant part of the city into communication, we must go through a central exchange. If we were to complete the analogy and use the telephone system for power control as well as message transmission, then we might have occasion to synchronize and harmonize activities in different parts of the community. We should need a bigger and more complicated central switch-board, but the size and complexity of the latter would depend, not on the size of the community, but on the number of activities we might wish to integrate.

The analogy helps us to understand the function of the nervous system including the brain, but as is always the case with analogies it will not do to reason from it.

In the first place, the telephone company is interested in rendering a public service for which it gets paid and not in furnishing professors of neurology with a complete parallel.

In the second place, the telephone system is a mechanism and not an organism. It does not rapidly waste with use and as rapidly repair itself. It does not organize itself for service. It will not automatically call up reserves when the situation calls for such action — and yet some systems do things which are much like that.

Finally, users, operators, and the wires and switch-boards are not all one; and they are all one in the nervous system.

Now, our author makes exceedingly clear that the nervous system is a conveyer of impulses and as such an integrator of activities, and not an originator of energy. It serves much the same purpose as wires and switch-board and not as the generator of electric current. To

use another analogy, it pulls the trigger on the pistol and serves something like a mechanism which would pull the triggers of many pistols in desirable sequence; but it is not like the explosive chemical which hurls forth the bullet. Such functions as these are served by visceral and muscular organs.

Thus, it would be hard to find in the pages of Sherrington any justification for the notion that the brain thinks or feels or manifests any other psychical activity whatever. It is equally clear that the brain and nervous system, and the bodily energizers and effectors which are integrated, *furnish the conditions* under which thinking and feeling go on.

There is scant justification here for talking about the education of the brain and nervous system; there is much justification for talking about organization of the nervous system for the *effectuation* of certain kinds of learning products. Even so, instruction is concerned with the learning products; neural pathways for the most part take care of themselves.

The second of the two treatises is Child's *Physiological Foundations of Behavior*, 1924.

Professor Child's work goes beyond that of Sherrington, for he deals therein with the physiology of the living body in general and not merely with the physiology of the nervous system, with organism as found in lower forms as well as with that found in the human animal.

The aspects of his work with which we are concerned are his physiological gradients and his head dominance.

In the theory of gradients, he finds living process, in this case metabolism, going on at lower and lower intensity as we follow structures downward from the head and outward from the axis of bodily symmetry. The

consequence of this, as I understand him, is the dominance of the region of highest metabolic rate. Whatever is to happen will tend to happen there first.

More than that, as we follow the story of organic evolution upward, it seems as if head dominance were in the nature of necessity to the survival of higher forms, counting even some very low forms as relatively high. So much so that when individuals of lower forms, in which regeneration of parts is possible, are deprived of the apical end, they develop wholly or in part new heads. The process can be seen in the vegetable kingdom when the terminal branch of a tree is destroyed; a lower side-branch near the apex grows upward and becomes the head.

Child's work, for our purposes, reinforces that of Sherrington and gives it wider application. It reveals the brain as serving the primary purpose of dominating the physical organism and in the broadest sense directing its physical adaptive responses, both with respect to growth and with respect to physical overt behavior. Dominance suggests something dynamic, as if the brain were a storehouse of energy or a generator of some sort. Nothing of the kind. Dominance consists merely in the fact that here is the main switchboard for incoming and outgoing impulses and in the further fact that in the top of the metabolic gradient processes can start sooner than elsewhere. The work gives us scant reason for viewing the function of the brain as being anything else than physiological, or as furnishing anything else than the *foundations* of behavior. We find no reason for supposing that thinking and feeling are physiological functions at all; and still less reason for believing that either process, in the presence of a physical environment, could go on apart from physiological processes. Let us bear in mind, however, that

thinking and feeling, albeit we apprehend them as psychical, are as truly organic processes as are neural and visceral processes. As processes, however, they are to be distinguished from their product as found in personality.

The contribution, however, which seems to have proved most fundamental and most enlightening is the theory of gradients. It is enlightening because in the first place it advances our knowledge of the method of integration, and it is in the field of method — how it is done — that nature has always been most enigmatic; and because in the second place it reveals the groundwork of qualitative change and the intervention of new adaptive processes.

In an earlier work, *Origin and Development of the Nervous System*, Professor Child pointed out that at different points of the gradient — that is to say, at different metabolic rates or perhaps different levels of electric potential — conditions are established under which new processes can begin to operate.¹ Thus, both in the race and in the individual, the primary adaptive function of the neural organism can and does expand at need to meet new requirements. The notion seems to me to be pregnant with very large speculative possibilities in the whole field of the sciences which deal with Man, and notably toward the clearing-up of the mystery of the method by which the physical and psychical aspects of the adaptive organism are related. Be that as it may, it contributes further to our comprehension of the function of the nervous system as being the trigger of the musket rather than the explosive charge.

In our field, it throws light on the problem of the difference between normality and subnormality in adaptive

¹ See also, as bearing on the emergence of life, H. F. Osborn, *Origin and Evolution of Life*, 2 and 68.

capacity and hence on the whole issue of educability. More than that, it tends to confirm our view that particular learning products are qualitative changes and not mere grades in achievement.

The notion has interesting parallels outside the adaptive organism.

We are familiar, for instance, with the principle that while there is no qualitative physical change in ether vibrations, as we ascend the scale from infra-red to ultra-violet, there is a range within which the conditions are right for vision and outside of which the conditions are not right. Every chemical compound is an example of qualitative change. Water is water, a combination of particular proportions of hydrogen and oxygen. Chemistry cherishes no illusions that one proportion is almost-water and another super-water.

Something of the same sort occurs in social evolution. The historian, Wingfield-Stratford,¹ for example, in discussing the beginnings of the Industrial Revolution in England, points out that the mechanical inventions associated with the transformation of industry were mostly old stuff, so far as the underlying ideas were concerned. Knowledge of the essential principle upon which the steam engine depends was as old as Greek antiquity. James Watt, commonly recognized as the inventor, saw himself as the improver of a pre-existing machine. But conditions ripened and a whole set of new machines and new industrial processes came into being. The conditions were primarily outside of the field of mechanics. They were chiefly the rise of credit economy and the accumulation of capital. If conditions had ripened in the thirteenth century instead of the eighteenth,

¹ *History of British Civilization.*

the Revolution would have occurred in the Middle Ages. The history of social response to geographic environment is of course full of similar illustrations of the principle.

LABORATORY INVESTIGATIONS

So much from the broader interpretations found in treatises in neurology and general physiology. Let us turn now to specific laboratory studies. Here again, I shall cite the work of two investigators, Franz and Lashley. If the reader desires to go farther, he would do well to begin with the works cited below.¹

Frontal lobes. In the first investigation cited, the procedure was training in the use of a puzzle box in response to a food stimulus, followed by a cut around the frontal lobes, and a period of waiting for recovery from surgical shock.

Four cats and six monkeys were used. In no case was there retention of the specific learning for which training was done, but in every case an abundance of older learnings were retained.

The animals operated on and in which the learning was lost learned again readily enough without any direct connection with the frontal lobes.

In the cats there was no disturbance of affective response in the presence of a cage of mice.

Four monkeys were trained longer and then operated on. In none of these four animals was there any loss of the learning and in one case tests showed retention after 161 days.

¹ S. I. Franz, *On the Functions of the Cerebrum — the Frontal Lobes*, Archives of Psychology, No. 2, 1907.

S. I. Franz, *On the Functions of the Cerebrum: The Occipital Lobes*, Psychological Monographs, XIII, No. 56, 1911.

K. S. Lashley, *Brain Mechanisms and Intelligence*, 1929.

It perhaps ought to be stated that such experiments are carried on under anaesthesia; they would be worthless for scientific purposes if they were not.

Three significant disclosures can be noted:

1. That none of the animals lost any of its older stock of learnings, so far as could be judged, whereas both cats and monkeys lost the newly acquired products of training.

2. That the lost new learnings were acquired over again without use of the frontal lobes, whereas the frontal lobes must in some way have been concerned in the original new learnings, or else the new learnings would not have been lost.

3. That four of them, trained longer than usual and tested at later follow-ups, did not lose the new learnings, even temporarily, after the frontal lobes had been cut off.

Franz attempts to account for the retention of old learnings on the supposition that when new habits become older, a process of transfer to lower centers takes place. This, of course, is sheer assumption based on the preconception that all learning is in some way a matter of neural patterns, which is to beg the question.

Now, laying aside all preconceptions as to association, neural pathways, and cerebral dynamogenesis, I think the following is fairly evident:

1. That when learnings had been finally and assuredly mastered, in the cases of older learnings and the new learnings in the last four monkeys, the cortex, and, so far as we know, the brain and nervous system as a whole ceased to be concerned in the learning product at all, as a matter of registration. The learning product passed out of the conditioning control of the brain and passed into another realm, call the latter what you will. If the animals were human, we should say that the learnings had become personal. We may perhaps call them "quasi-personal."

Doubtless the experimenter could have interfered with the execution of learning — that is to say, with adaptive

response founded on learning — by cutting off the motor nerves to the legs through which the learnings were expressed, but this would merely have been the equivalent of preventing the animals from carrying out learning without destroying the learning itself.

2. The frontal lobes, and doubtless the brain as a whole, were involved in the experience out of which new learning emerged, but not in the retention of learning; that is, not in the learning product as finally mastered.

3. That until mastery takes place, these learnings are not learnings at all, but only improving adaptive responses. Cutting off the frontal lobes in all the animals save the last four monkeys was in essence interference with the learning process, but not with the learning product.

Note that the peculiar value of Franz's investigation hangs on the contrast afforded by the four monkeys.

Occipital lobes. Four years later, Franz reported his investigation on acquired color discrimination with eight monkeys. He had improved operative technique, especially in respect to precision.

After learning, he cut off the occipital lobes in some cases and destroyed the occipital cortex with a cautery in others.

In all the cases there was more or less post-operative disturbance. There was in particular some motor disturbance, but this disappeared.

In general, after allowing a short time for recovery from surgical shock, the animals exhibited little or no observable or measurable disturbance of vision at all and no loss of the visual learning product.

In one of the animals, something went wrong, but even so the results amounted to a valuable check on results in the others. In this animal, the cautery was inserted

into the brain substance as well as being passed over the cortex of both occipitals. There was some disturbance, although visual functions were present, until at the end of ten days the animal had all the appearance of being blind. On necropsy, the brain was found to be bulging above the level of the bone. Evidently there was swelling and compression, and the organ as a whole must have been more or less thrown out of commission. Even so, the learning persisted until adaptive response was checked through the failure of vision.

Now, in these learnings, it will be noted that no motor learning was involved, as is the case where an animal learns a maze by running through it or learns the manipulation of a puzzle box. Interference with the cortical area known to be concerned with vision did not abolish a visual learning product. Wherever visual learning products are laid up as neural patterns, if anywhere, it is certainly not in the area which is known to be intimately concerned with vision, at least in monkeys. That, however, does not rule out the possibility that such neural patterns are established elsewhere in the brain. On that point, we shall need to look further.

Lashley's work. Lashley's investigation was much later and I should think more thoroughgoing, both in experimental method and in logical analysis, than most of what had gone before. In particular, he made sure of actual learning or mastery.

He dealt with rats in maze-running, puzzle box, and brightness discrimination. That is to say, his rats had to learn how to get their food: in some cases by finding the way through a maze; in others by learning how to open a puzzle box; in still others by learning that an illuminated screen indicated the place where their food was.

In summary the disclosures seem to be as follows:

1. That cerebral lesions have little effect on retention of brightness discrimination even up to sixty per cent of the neopallium.

2. That cerebral lesions show much the same effect on puzzle-box learning as on brightness discrimination.

3. That maze-running is affected much in proportion to the complexity of the maze and in proportion to the amount of tissue destroyed.

4. That blinding the animals did not interfere with maze learning, and yet destruction of the occipital region abolished the learning product. This finding put over against the revelation in brightness discrimination seems to me particularly significant, for it plainly suggests that maze-running is a motor learning — that is to say that it involves an organization of neuro-muscular patterns. Note, however, that this does not necessarily imply that the learning product, as such, as distinguished from the necessary mode of its expression, is abolished. We shall return to this discrimination in cases of aphasia.

Laboratory studies summarized. The studies of Lashley are on the whole in striking harmony with the earlier studies of Franz. Putting the two together, it seems to me fair to draw the following inferences, at least so far as the lower animals are concerned:

1. That the brain, like other parts of the body, is an instrument of experience-getting and that it serves much the same purpose as do such mechanical instruments as microscope and telescope in the hands of men. These, too, are means of getting experience which is otherwise inaccessible.

2. That the self acquires learning through the instrumentality of the adaptive organism as a whole, but learning once acquired is not laid up as a system of neural

patterns, save in the case of learning which is neuromuscular in character.

3. That we must discriminate between learning products themselves and the adaptive behavior founded on learning. We must admit that it is conceivable that if a rat whose brain had been damaged could introspect and speak he might say to us, "I know how to run that maze, but I can't do it."

Whether or not the findings of Franz and of Lashley would hold good for Man, we have no positive means of knowing. Lashley thinks that what is true of his rats is probably true of dogs, monkeys, and Man. Franz's study of the frontal lobes would seem to show that it is true of monkeys in so far as his work with those animals paralleled the work of Lashley. Nevertheless, we do not tolerate vivisection in Man, however humane the technique may have become. So far as Man is concerned, we must turn to clinical sources for our evidence.

CLINICAL DISCLOSURES

There are in general three sources of clinical evidence: from necropsies in cases of nervous and mental disease, from surgical operations on the brain, and from undoubted impairment of brain function in cases of known lesions.

Subnormality and abnormality. It is hard to make much out of the first type of evidence, largely for the reason that in the present state of science, malady is not sufficiently defined. We do know that behavior may be altogether abnormal without any discernible organic malady whatever, either physical or psychical. During the past half-century or less, it has been becoming increasingly evident that a great deal of abnormal behavior is personal and not organic; that is to say, traceable to

education which has gone wrong and not to defects in organic structure or to organic malfunction. It is extremely difficult, however, to draw the line and say that on this side is personal disorder with neither organic consequences nor origins, and on that organic malady pure and simple. Granted that a personal disorder exists, it must always reveal itself as maladjustment, and maladjustment, unless it be compensated, is prone to result in a chronic emotional state of the organism. Such a state may have serious organic consequences. Psychopathologists thus draw distinctions between *neuroses*, where the disorder is organic in origin; *psychoneuroses*, where there are organic consequences, and *psychoses*, where there is no organic concomitant and where the disorder, in our terms, is personal.

Suffice it to say that in definite feeble-mindedness and in some other forms of what is known collectively as mental and nervous disease, autopsy commonly shows either malformation of brain structure, destruction of brain tissue, or lesions in brain substance. A great deal more has been made out of this material than it will bear. If, for instance, a man seems to have lost his wits, dies, and a necropsy shows impaired frontal lobes, it seems easy to conclude that the frontal lobes are the "seat of the intellect." To make out the case, it would be necessary to show that normals never have impaired frontal lobes or other abnormalities in cerebral structure. Thus has a great deal of brain mythology grown up.

In general, taken in connection with laboratory findings and other forms of clinical evidence, about all this type of post-mortem material shows is that the great central station through which experience comes in may be so poor or so impaired that: (1) the child can get no valid

experience and therefore cannot learn; or (2) that the mature adult cannot express his learnings in normal behavior. In the latter event, it must be remembered, behavior is itself experience, and therefore in the presence of a damaged cerebral organ personality goes more and more askew and expresses itself in behavior that is more and more abnormal.

Surgical. In recent years, greatly improved technique in brain surgery, especially in the removal of brain tumors, has given us considerable definite and positive evidence. Such cases are doubly valuable. In the first place, more or less pre-operative destruction of brain tissue or interference with brain processes are found; and in the second place, the operative procedure itself often cuts away brain tissue and even whole sections of the brain. The patient exhibits behavior phenomena both as a result of the disease and as a result of the treatment.

Dandy, for example, has removed all the right hemisphere, both frontal lobes, left occipital and lower half of left temporal. All of this cutting has been done and left the patient oriented in time, place, and identity; with memory unimpaired; with such school learnings as reading, writing, and arithmetic still good. Of course, when sensory and motor centers are interfered with, adaptive responses are either impaired or destroyed, even to complete paralysis of one side of the body. But when the blood supply is cut off, consciousness is abolished and of course personal behavior of all sorts ceases. Further, the surgeon cannot meddle with the older parts of the brain which are concerned with the vital processes.¹

¹ A descriptive account can be found in Cannon's *Wisdom of the Body*, 222.

Dr. Dandy's report on five cases can be found in the *Journal of the American Medical Association*, 1928, 90:823, and a further report in the *American Journal of Physiology*, 1930, 93:643.

If the contention that learning products are preserved as neural patterns in the brain is sound, its proponents have much to explain. Surely, all this cutting right and left must have erased neural patterns if there were any to erase, and indeed have sorely impaired intellectual processes proper if these were in any sense also brain processes. In truth, clinical evidence began to appear more than forty years ago which became an obstacle to the brain-registration theories, an obstacle which was never overcome.

It is to be observed that a distinction must be drawn between mental normality *per se* and retention of learning products. Survival of normal sense perception, memory, orientation, and the like are mental organic phenomena. But living happily and in gratitude for a longer lease of life; answering questions accurately; responding to mathematical tests; good sense of humor and rationality — all of these imply survival of the personality; that is to say, of learning products.

The cases which involved removal of the right hemisphere of course all led to paralysis of the left side of the body, save in the functions which are essentially bilateral. We are not told whether all the patients were right-handed. Assuming that they were right-handed, the case against neural patterns breaks down so far as this evidence goes, provided it is granted that all learning products originate in experiences with limbs and voice. In that case, neural patterns, if any, would form in the uninjured left hemisphere. In fact, the evidence is tolerably clear that in right-handed persons, sensori-motor learning that originates in hand and vocal organs does register in the left hemisphere, albeit when the left hemisphere is injured, it seems to be clear that the opposite side of the brain will take up at least vocal functions. But here we must as al-

ways critically distinguish between adaptive response and learnings upon which adaptive response is founded. The issue is discussed more fully below in connection with aphasia and kindred maladies.

We need not pursue this line of evidence further save to point out that similar operations and disclosures have become commonplace in first-class brain clinics.

Effect of injuries apart from treatment. Cases reported in *Archives of Neurology and Psychiatry* running from 1920 to 1930 enable us to glean considerable evidence bearing on our problem, drawing the distinction noted above between strictly mental phenomena and those which are personal, and further between these and sensory or motor disorder.

In the series are fifteen reports which contain material pertinent to our inquiry. The bulk of the rest of the material is concerned only with purely surgical and medical interests. In the list are injuries ranging from a simple operable tumor to one lying across the longitudinal sinus and extending almost to the base of the skull (treated with radium, apparently with some success) and another in which were several tumor masses on the surface and one in the depth of the brain substance.

In the list, only one shows indubitable personal disorder. In that case the patient was an old man past seventy in whom school learnings were entirely gone. In the cases as a whole, but four show indubitable mental disturbance as such, impairment of memory being the distinctive symptom. On the other hand, motor disturbances, such as aphasia, agraphia, and alexia, were present in six cases.

Kubitschek (*Symptomatology of Tumors of the Frontal Lobe*, *Archives of Neurology and Psychiatry*, 1928, 20:559)

presents a review of twenty-two cases and summarizes the mental symptoms as follows:

Marked disturbance early	
Moderate disturbance early	3
Slight disturbance early	3
Slight disturbance late	6
No disturbance	8

Case of personal regression. We pass from this report to a case in which there was indubitably personal regression; that is to say, the patient prior to operation became as a little child. The report is taken from Cairns, *Intracranial Surgery*, British Stationery Office, 1929.

Tumor of the right frontal lobe in a middle-aged person of superior social accomplishments. Technically, the case is summarized as follows:

Cystic glioma (protoplasmic astrocytoma) of the right frontal lobe. Profound mental deterioration, etc., operation: evacuation of cyst and removal of neural nodule of solid tumor. Complete recovery.

Mentally the patient was disoriented and memory for recent events was grossly impaired. Comprehension of speech for any but the simplest words and phrases was impaired. Incoherency in speaking and writing and unsteadiness in walking developed. The patient became the reverse of what had been characteristic: apathetic, forgetful, slovenly in appearance and habits, unconcerned over incontinence of urine and feces, in brief, typically childish.

Now we can discriminate, in the foregoing abstract of the full report, between organic and personal symptoms.

Organically, there was interference in memory and its implications such as is frequently noted in the other cases. There was motor impairment in walking and perhaps in speech, although it is perhaps doubtful whether it was speech that deteriorated or language that was lost.

Volitionally and in other personal aspects, notably modesty, phenomena were exhibited which are characteristic of regression to early childhood.

There was emotional disturbance, and that is of course common, but in most other cases emotional irregularities are not accompanied by regression.

This case is so clear-cut and the clinical picture is so different from the general run of cases reported that I think we can make a good deal out of it, although the interpretation is admittedly at the stage of hypothesis.

First of all, let us compare the case with that of the old man in the group noted above, the patient who is described as having lost his school learning.

Next, the reader will recall the contrast between retention of learning in the case of Franz's last four monkeys, which had been thoroughly trained, and loss of learning in his other animals; and likewise the contrast between retention of old learnings in all of Franz's animals and loss of new learning in all but the four.

In the third place, let us place in the picture Lashley's rats, where the experimenter made sure that all his animals were thoroughly trained, and note the contrast between retention in brightness discrimination and loss in maze-running.

Finally, attention is invited to the disclosures of Chapter IV of my *Practice of Teaching in the Secondary School*, in which it was shown that pupils in school can exhibit high class standing, so long as the criterion is quality of performance on daily work and the passing of examinations, and yet exhibit utter lack of the learning product which daily performance on lessons is supposed to generate. Note also the discussion of the distinction to be drawn between learning adaptive responses, learning what

to do, and attaining true personal adaptations, becoming the kind of person who knows what to do.¹

MacCurdy's discussion of what he calls image functions and liminal images, in Chapter II of *Common Principles in Psychology and Physiology*, is suggestive of the process which may be at work when learning passes over from practicing adaptive response to true adaptation.

In the case of maze-running, Lashley's rats presumably acquired a set of neuro-muscular responses in a learning product which was kindred to walking and was no doubt in the nature of a specific kind of walking. The learning product was thus in the nature of an organization of neural pathways and interference with any part of the neural pattern, and especially the co-ordinating center, would necessarily abolish the learning product, as indeed any such product must be abolished by appropriate interference with the brain when in fact the learning itself is in the nature of a motor neural pattern or when the manifestation of the learning product is through motor activity.

Much the same situation is noted in cases of aphasia and kindred disorders noted below.

It may then well be that the early stages of any learning process utilize the cortex as they do the rest of the nervous system, and indeed the body as a whole, including the visceral organs, in acquiring the experience out of which true learning is built up. Such was apparently the stage in Franz's partially trained animals, whereas in his fully trained monkeys the learning product, which, be it noted, was imaginal and not motor in character, had passed out of the process stage and had ceased to be a neural pattern at all.

So it apparently is at times in humans. In half-learn-

¹ See pages 107-111.

ing, lesson-learning, adaptive-response learning, the learning never passes out of the stage of process into that of product, never ceases to be organic and becomes personal.

Thus it is not difficult to believe that in many people genuine mature personality never develops. What they learn is conformity; they do not rise above conformity by becoming the kind of persons who know what to do and can and will do the things for which conformity stands.

If that be so, they are forever in the situation of Franz's half-trained cats and monkeys, and my lesson-learning pupils. Whatever they do in life is pure organic response. Learning to live in the world is always in process and never complete. Anything which interferes with the basal organism itself throws them completely out of the apparent adjustment in which they live. This view of the situation at least explains all the facts and accounts for all the discrepancies in evidence.

So it was with the patient in Cairns's report. So with the old man who was said to have lost his "school learning."

Senility. We get similar contrasts in observing cases of senility.

Here is an aged man who exhibits the symptoms typical of senile dementia. Memory is greatly impaired or gone altogether, the senses are dulled, judgment is destroyed. But, more than that, he makes no effort to be decent in any way, exhibits no concern for any kind of indecent behavior either physical or moral, cannot be trusted out of constant custodial care — in short he is in his "second childhood."

On the other hand, here is an old lady who exhibits precisely the same mental defects, and finally mentality is so far gone that she must live under sanatorial care.

And yet throughout she exhibits no personal deterioration whatever, though true enough physical weakness requires the services of an attendant. She is decent in all respects, she can be trusted to manage her own getting-about in the world, so far as physical and mental capacity will permit. She knows as much as she ever did.

In the first case, personality had in large part been spurious, and when the adaptive organism broke down apparent adjustment disappeared with it. In the other case, personality was genuine and adjustment persisted to the end, despite the fact that an organism weakened in both its physical and mental aspects in the end made impossible the adaptive responses for which personal adjustment in itself considered was adequate.

Aphasia, alexia, agraphia, apraxia. When the organism is pressed beyond its capacity in adults, or where there is injury to the cerebral processes concerned in speech, coherent utterance fails or else the patient cannot sense the meaning of what others say to him. The malady is known as "aphasia," motor or sensory as the case may be.

Similarly, patients sometimes lose their power to make sense out of reading matter or are unable to express themselves in writing. These are cases of "alexia" or "agraphia."

Again, they sometimes lose the power to carry out certain arts or "doings" over which their command has been good. This is "apraxia."

We all of us experience these maladies in mild and momentary form when we are fatigued, or when we are in more or less of a toxic condition, or when perhaps circulation is poor.

Now there is no loss of learning here. The aphasic

patient knows what he desires to say, but he cannot say it. Personality is sound, but a badly working organism deprives him of command over utterance. So with these other maladies of this type.

OTHER INJURIES

The literature is replete with accounts of all sorts of instances of injuries to the brain and their consequences. A fracture of the skull may have involved driving a fragment of bone into the brain tissue, or perhaps a foreign body, such as a fragment of nail or a bullet, may have landed in the brain. Such injuries may, of course, carry infection with them and thus involve putting the adaptive areas out of commission altogether. Saving that, however, the injury may result in interference with some motor center and paralysis; or it may destroy the basis of mental processes proper, such as perception. For example, a piece of bone from the skull cap is driven into the brain substance and visual perception fails. The victim can see, but he does not organize his visual sensations. Meeting a friend, there is no awareness even that a man is in the vicinity. When the friend talks, awareness is normal so far as auditory experience goes.

Nearly all such cases are instances of injury to the organism such as either make it impossible for current experience to register or else make appropriate motor responses impossible. Thus adaptive response predicated on personality becomes impossible, but no personal learning is lost. If a man be blinded and rendered stone deaf, he will be unaware of familiar objects as they are encountered, but nobody would say that he has lost the products of experience in terms of which he normally recognizes objects. If a man be paralyzed and unable to

get to his office, nobody would be justified in interpreting his behavior as evidence that he has lost all knowledge of business.

In children. Evidently when injury occurs in childhood or when there is serious deformity of the brain from birth, or other inadequacy of the organism, the development of personality will be interfered with, not because of lack of dynamic qualities, but because the victim cannot get the experience out of which learning normally arises.

Vital functions. We perhaps ought to remind ourselves that all through this discussion we have been concerned with that part of the brain which is above the basal ganglia. The lower levels of the organ as a whole are more intimately related to the co-ordination of the vital functions with the requirements set up by external circumstance. Hence any injury to these parts, either directly by lesions or indirectly by shock or the consequences of infection, will put vital functions themselves out of commission and death will ensue.

III

THE WEIGHT OF THE EVIDENCE

Putting the whole body of evidence together, it would seem that we are justified in drawing much the same inferences which we have already drawn from the laboratory material.

1. The function of the brain and the nervous system as a whole is that of relating the self to the external world and co-ordinating bodily activities as such; but the function is purely instrumental.
2. Organic functions which we call mental or psychical are dependent on normal functioning of the nervous

system as a whole. Thus, visual perception is dependent on the possibility of physical vision, but no more so than on the existence of certain vibration frequencies in the external physical medium of transmission.

3. The nervous system and the body as a whole constitute an organism through which experience occurs, and, since the learning process is dependent on experience, it is also dependent on the organism remaining intact.

4. The learning product in actuality — that is to say, genuine as distinguished from apparent or spurious — is not registered as a neural pattern, save in those cases where it is in its nature a sensori-motor product, pure and simple. Nevertheless, where learning products are *manifested* in motor activity, interference with the organism may necessarily interfere with manifestation, and therefore the student who excludes any and all evidence which does not come from behavior must necessarily be deceived as to the nature of the learning product itself. He draws purely materialistic conclusions because he excludes all evidence that is not purely physiological in character.

5. It follows that the consequences of interfering with the brain during childhood must be a very different thing from interference during adult life. Process can be stopped; whereas product is not necessarily abolished.

6. Learning products inhere in the self and constitute modification and extension of the self — that is to say, personality.

7. Self cannot be understood as inhering in the organism in either its physical or its psychical aspect, nor can personal learnings nor personality. These are realities, in fact they constitute the fundamental reality of existence, but they are not material.

8. The best clue touching the function of the brain as a bodily organ which we are able at present to find can be summarized somewhat as follows:

(a) Within the cerebral hemispheres are central organs which serve as the co-ordinating centers of the vital functions themselves. Whenever these are injured, either directly or indirectly, death ensues.

(b) The cerebral areas, especially in the cortex, are the regions in which all sorts of sensori-motor activities are co-ordinated, ranging from the modulations of the voice to the finer co-ordinations of the fingers. Numerous learning products which are essential both to getting experience and to expressing learnings which arise out of experience are in truth registered here as neural patterns, but in no other sense than the same sensori-motor learnings are registered in the muscles of voice and limbs.

(c) Similarly, subcortical regions co-ordinate and control the bodily processes which are concerned in affect or feeling, make affective experience possible and further make possible affective expression. Nevertheless, affective learning products are not the same thing as the experience out of which they arise nor is it correct to say that such learnings — appreciation of a sunset, for instance — are registered in the hemispheres.

(d) Finally, the brain acts as a whole as well as a great switchboard. In this sense, it is essentially a great body of tissue which possesses a high metabolic rate, is anatomically so placed in relation to general bodily architecture that it serves the purposes of head dominance, and as such it furnishes the conditions under which consciousness exists. The surgeon can apparently take great liberties with the organ as a whole, provided he does not meddle with blood supply and therefore with the rate at

which living goes on. When the latter is impaired, either mechanically or chemically, the conspicuous phenomenon is loss of consciousness

Bearing on theory of education

It follows that education which appears as a process of personal development in the individual does not inhere in the organism which makes it possible. Any such expressions as "educating the brain" or "educated brains" are meaningless. The brain does not become educated.

The conclusion has much more than an academic significance; for, both in the past and in the present, some theories of education which have dominated instructional practices in the schools could have no valid bases whatever, save as in the last analysis they rested on the conviction that education is in truth a matter of organizing the brain or at least the adaptive organism.

In this chapter, we have been concerned in tracing out the specific functions and processes of the physiological aspect of the adaptive organism with the purpose primarily of arriving at some clear conclusion based on evidence touching the nature of education and of the educational process.

We must now turn to a similar study with a similar purpose of the psychological aspect.

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CHAPTER VI

PSYCHOLOGICAL ASPECT OF THE ADAPTIVE ORGANISM

IN THE present chapter we propose to deal with those adaptive processes which we apprehend, and rightly, as non-physical or psychical. In so doing, however, we caution ourselves over again that we are not dealing with a separable *part* of the adaptive organism. The organism is one, and it is misleading to think of those processes in which we are now interested as belonging to a kingdom of thought different from that which covers those with which we were interested in the last chapter. As we have seen (Chapter IV), we are in the presence of an organism which has a biological history, one in which new processes, but not new methods of adjustment, have been successively evolved. This, however, no more constitutes a reason for believing that we have entered a new realm than such social changes as those which were brought about by the Industrial Revolution or the rise of American democracy constitute a reason for thinking that something else than society thereupon came into existence. The new thing is not in the organism, but in what the organism makes possible, just as at an earlier point in cosmic evolution life appeared when conditions were suitable, but no new elements enter into the constitution of the living body and, so far as we can see, no chemical processes which are less chemical than those which appear in the inorganic world.

Psychology has sometimes been called the science of behavior. Not so. Economics and politics are examples

of sciences which deal with human behavior. If psychology took for its province the whole field of human behavior, not to say behavior in general, it would evaporate into sheer vagueness. Properly speaking, it is the companion of physiology and is the science of psychical processes just as physiology is the science of physical or bodily processes. Thus, psychology is a biological rather than a social science.

Nor are we dealing exclusively with processes which are properly classifiable as mental. We deal with others as well, some of them more primitive and more fundamental than are the mental processes.

Nor, finally, are we dealing with the elaborated bases of human behavior which constitute personality and are therefore to be labeled as personal and neither physical nor psychical. This last is not the field of psychology, but rather the field of education.

We pass by primitive tropism and reflex behavior, since the latter are as purely physical as are the processes of circulation and digestion, albeit the former are doubtless adaptive and not merely somatic processes.

We are concerned only with those adaptive processes which normally go on at the level of consciousness. As we shall see, the origin and maintenance of consciousness is the grand organic problem.

I

BELOW THE LEVEL OF LEARNING

Studies of the field which we have thus marked off commonly begin with Instinct, which was once described as governing that which we do we hardly know why, a thoroughly inadequate definition, since it would cover not only instinctive but educated behavior as well. The

greater part of the behavior of the fully mature person is not accounted for by him unless he is qualified to introspect and analyze and takes occasion to do so.

Now the progress of investigation and critical analysis has left little reason for further use of the term. Time was when any otherwise unaccountable item in observed behavior was accounted for by the conclusion, "There must be an instinct for that." And so a favorite device was to catalogue "instincts" or "instinctive traits." This was natural enough so long as ideology was founded on the notion of faculty or even more on the notion that specific organs must be found to match every piece of adaptive behavior. The fallacy was not in the instinct theory itself, but rather in the misconception of the nature of the organism which gave rise to the theory.

Nevertheless, the field of unlearned behavior is the starting-point of our present inquiry. It is not accounted for as reflex nor yet as tropistic behavior. Laying aside all preconceptions and definitions based on undemonstrated neurological interpretations, and grounding ourselves in the facts observed in the field and in the laboratory, we can still make a good deal out of what is known.

Native Adjustment

In the first place, we need to draw a distinction between behavior founded on *native adjustment* and other forms of unlearned behavior.

People have always been interested in the marvelous adjustments exhibited notably by some of the insects and by the birds, and which, making all due allowance for inaccurate and uncritical observation, seem undoubtedly to be unlearned. Some of them are incontestably untaught, for they appear when there are no older individuals

of the species to do the teaching. They are unlearned, for the creature manifestly has had no previous experience out of which learning could arise. The lower orders frequently make accurate provision for the incubation of their eggs and nourishment of the young in the bodies of the hosts in which the eggs are planted, when the parents have had no experience of any young at all. Some of the insects — wasps, for example — exhibit a form of accurate behavior in stinging and killing their prey which humans could command only on the basis of an accurate knowledge of the anatomy and physiology of the prey. Some of the birds in their migrations exhibit behavior which in us would require a knowledge of geography and navigation.

Such native adjustments seem always to be found in behavior which is essential to the perpetuation of the species, in nest-building and in preparation for the incubation and nourishment of the young; or else to the preservation of individuals, at least in the long migrations of birds over water.

Now, people who are predisposed to read back into the lower forms ideas which come from human life find themselves unable to believe that the marvelous adjustments of some of the insects and the birds could be organic. They must be learned. It stands to reason. The only similar adjustments with which we are familiar have been learned, in the course of a long and arduous educational process in the individual. In other words, it is hard to believe that such adjustments can be native in the organism, and yet the incontestable evidence of the facts shows that they can be and are inherent. From the human standpoint, the adjustments are incredible, but they are real.

Less naïve, but at bottom no less illogical, is the attempt to account for these adjustments on the ground of purely physiological, if not narrowly neurological, behavior patterns. The reflex arc and the known principles of the tropistic behavior have hag-ridden much of psychological thinking throughout materialistic times. It is patently absurd to explain all behavior in terms of human behavior, but explanations which rest on physiological processes alone, merely because such processes are known to exist in both the lowest orders and in Man, is a fallacy of the same order. Nobody knows *how it is* that wasps and birds know how to build nests, or spiders webs, or bees their honeycomb; but everybody knows that so they do.

The adjustments are there, and we cannot doubt that they have arisen, directly or indirectly, by the same process of variation, inheritance, and survival which we find in all adjustments subsisting in the organism itself. Viewing the facts as they are revealed, we must conclude that the adjustments of the type in which we are particularly interested — those found in ants, bees, wasps, and the like, and in birds — are instances of the principle which we have repeatedly noted, namely, the principle that adaptive *processes* in the course of evolution rise to higher and higher levels without change in fundamental adaptive *method*. On principles of general physiology, it may perhaps be suggested that what is native is the kind of physical organism which furnishes the conditions under which the adjustments observed always come into play as soon as contact with appropriate external stimuli are made. This, as it seems to me, is about as far as the revelations of science entitle us to go.

As we pass upward through the mammalia, we find fewer and fewer of these elaborate native adjustments and

more and more adjustments which are learned in the lifetime of the individual. Nevertheless, we find few if any well-authenticated instances in which the learned adjustments have been taught by the parents, and none, of course, in which cultural products have been taught.

Whether there remain in Man any of the native adjustments is doubtful. Those which apparently appear in infancy — namely, seeking the breast and fear of falling — are as easily accounted for on reflex grounds as on the theory of adjustment at a level above that of reflex. We have no clear empirical evidence, for we have no well-authenticated records of feral man. Assuredly, there is no evidence whatever of native adjustment beyond the first few weeks of infancy, for subsequent to that period human behavior is based on education.¹

Impulse

There is a very large field of behavior which is not founded on specific adjustments either native or acquired. The creature acts on impulse. Impulse, to be sure, sometimes signifies abruptness in response, but it also means "a motive, propension, or natural tendency other than rational or instinctive."

Now, viewed from the human standpoint, impulsive behavior is deemed reprehensible. "I acted on impulse" is commonly an apology rather than an explanation. And yet impulse is the ground plan of perhaps the larger part of behavior both in Man and in the lower animals. To say that it is organic, rather than learned and rather than personal, is only to say that it is part of the scheme of things and characteristic of organisms whose behavior is above that of tropism.

¹ See "Instinct and Man," Max Schoen, in *Scientific Monthly* for June, 1929.

When a predatory insect tugs at a grub, now this way, now that, instead of seizing it in a particular grasp and no other and dragging it in a certain fashion and in no other way, we need not necessarily conclude that its behavior is to be characterized as learned behavior. Nor is it necessarily founded on intelligence or volition.

When a higher animal dodges out of a danger which he has never encountered before, thus making appropriate adaptive response, again we need not on that ground attribute intelligence.

When a man, or perhaps a chimpanzee, exhibits concern for the young of his species, whether the latter be his own children or not, we need not assume that he learned the trait or that the trait is an instinct. The higher primates at least are put together that way, *how* we do not know, *why* we can readily see. The behavior is organic and unlearned.

Similarly, when the child of the past generation beheld an utterly strange mechanical contrivance bearing down on him, he scuttled for safety. He did not wait until it had maimed or killed a contemporary and thus learned from experience that it was dangerous.

Lifted to the higher psychical level, impulse, or at least organic behavior, is the basis of common-sense; but of course it is far from being all of common-sense, for common-sense is after all the cultural inheritance of common insights and sentiments. We say that a distinguishing mark of feeble-mindedness consists in the fact that the individual lacks common-sense; and so he does, common-sense of the organic variety. But the irritated parent sometimes says to his flaming youth, "I wish you would get some common-sense." He is referring to common-sense of the cultural variety.

In certain insect genera, impulse has been carried to an extent found nowhere else in the animal series. The behavior of some wasps, ants, and spiders exhibits *contrivance* which, when it is found in humans, we know to be based on intelligence and upon reasoning from cause to effect. It does not follow that it is similarly based in the insects. On the contrary, they exhibit no learning capacity at all commensurate with the scope of their contrivance, and, of course, they build no culture. In the evolutionary process, adaptability in them seems to have gone about as far as it could go on the basis of arthropod structure. The experiment seems to have been a failure, and it was necessary to return to the trunk line and proceed upward through untold millions of years in the evolution of the stupid vertebrates, until a creature was reached in which adaptability was a different kind of thing from what had hitherto been developed.¹

Now, native adjustment plus impulse is ordinarily the sufficient basis for the conduct of life in the case of all the sub-human animals, just because they have no culture and therefore live in a relatively unchanging environment. Their impulses are likely to be useful. But impulse is a totally insufficient basis for conduct in Man, for cultural changes are constantly modifying his environment. He requires personal development to match.

Organic processes. If we use the term "instinct" at all, it must be limited to the native adjustments to which we have referred above. As applied to behavior apart from these, there is no better ground for using it than there

¹ See Herrick, *Neurological Foundations of Animal Behavior*, chapter xi; Peckham, G. W., and Elizabeth, *Wasps Social and Solitary*, 1905, Houghton Mifflin Company; Wheeler, W. W., *Ants, their Structure, Development and Behavior*, 1913, Columbia University Press; Hingston, R. W. G., *Problems of Instinct and Intelligence*, 1928, The Macmillan Company.

would be for applying it to the physiological processes themselves. Nobody would care to speak of the instinct of digestion, but as well do that as speak of the instinct of self-preservation, or of sex, or of parental love. These are psychical organic processes, and whether we deal with the lower animals or Man they, and others of the same order, are the subject matter of the present chapter.

Education of the instincts. We may properly pause at this point to note the principle that there can be no such thing as "education of the instincts." Instinct is directly opposed to education — native adjustment to learned adjustment. Nor have children any instincts proper to be submitted to the educational process, even if that could be done. When people use such language what they usually have in mind is *appetite*.

II

INTELLIGENT, RATIONAL, AND CULTURAL BEHAVIOR

In all the books, at this point in the development of the argument, the vexed question of intelligence is bound to emerge. This volume is no exception to the rule, for the issue will not down.

Now such terms as "intelligent" and "rational" are descriptive terms which apply to different forms of modifiable behavior. They are not organic processes. There is no such thing as *an intelligence* or *a reason* which can on occasion be called forth and told to become active. Doubtless, however, the possibility of any kind of modifiable behavior depends on the kind of organism which any given creature is — that is to say, on organic processes. If we are going to consider modifiable behavior at different points in the animal series, we shall need three

terms, "intelligent behavior," "rational behavior," and "cultural" or "personal behavior."

Intelligent behavior and intelligence

Lloyd Morgan has this to say on the subject, "Now when we remember that the method of intelligence is to profit by chance experience, while the method of reason is, with foresight and intelligence to adapt means to ends..."¹

This is the definition of the term "intelligence" which has been developed in Chapter IV. That is what the word means in its derivation and the meaning gives us a satisfactory basis from which to deal with observed facts.

When the ever-useful dog-carrying-a-stick encounters a picket fence, and after several trials happens to tilt the stick and thrust it through, and when furthermore the dog eventually learns, it may be from several such experiences, that tilting the stick is a good way to get through fences where the interstices are broad enough to admit the passage of his body, but not wide enough to admit also the passage of a stick carried horizontally in his jaws, then we rightly say that the dog exhibits intelligent behavior. He has learned something, and thereafter his learning more or less controls behavior. If some other animal, confronted by the same situation, also hits by chance the same solution and yet never profits from the experience, but is always obliged to solve the problem anew every time he encounters it, then we rightly say that he exhibits no intelligent behavior.

If a man sits down before a similar problem and imagination furnishes a series of pictures of himself solving the problem until the right combination clicks, we may

¹ *Animal Behavior*, 219.

say that his adaptive capacity works at a higher level than that of the dog. We cannot, however, say that he exhibits intelligent behavior unless he solves the problem promptly in similar situations.

Thus, intelligence is the outcome of experience, but it is not experience itself. Evidently intelligence can accumulate in both dog and man. If the dog is a much-traveled animal and solves a good many problems in the pathway of life and profits from them all, he accumulates a good deal of intelligence and will doubtless be cherished as a very intelligent dog. And so it is with Man.

Distinguished from adaptive capacity. In this connection, we ought perhaps to remind ourselves of the important distinction to be drawn between intelligent behavior and intelligence on the one hand and adaptive capacity on the other.¹ Failure to make the distinction is the parent, not only of a vast amount of muddled thinking, but also of a nauseating amount of injustice to school children. Common speech makes the distinction when it uses such words as "cleverness" and "brightness," "stupidity" and "dullness," to characterize adaptive capacity; and then speaks of "persons of intelligence" and uses such expressions as "intelligent teaching." True enough, common speech is prone to make no distinction between intelligent behavior and rational behavior.¹

So we say properly that a dog who solves a problem by direct trial-and-error and learns something from the experience operates at a lower level of adaptive capacity than does the man whose trial-and-error operates at the imaginative level. Of two dogs, one of whom learns from experience more readily than does the other, we can say that there is a difference in adaptive capacity, albeit both

¹ See page 103.

of them exhibit intelligent behavior. Of the two, the first is, of course, likely to acquire more intelligence, but we cannot infer differences in adaptive capacity from observed differences in intelligence unless we know something of differences in experience.

In the case of children, an individual who shows no capacity to profit from experience, who perhaps solves many problems by direct trial-and-error and yet solves the last no more readily than the first, is lacking in adaptive capacity. On the other hand, an individual who solves problems by direct trial-and-error and profits from the experience readily enough, but never operates at the level of imagination, is also lacking in adaptive capacity. Nevertheless, the issue in the case of Man is complicated by Man's dependence on culture and on teaching, so much so that thus far no tests have been devised which will uncontestably separate out the effect of culture and leave observed behavior as a pure function of organic adaptive capacity.¹

Educational implication. Evidently organic capacity is beyond the reach of education. The two terms are antithetic. Intelligence at the human level on the other hand is one of the major products of right education.

Rational behavior

When a problem is solved by segregating properties of things, contemplating the course of cause and effect, and

¹ Hunter's classic experiment on delayed reaction is perhaps as valid and accurate a method of actually measuring relative adaptive capacity as has ever been applied. He could thus get at least some order of difference between rats, raccoons, cats, dogs and young children. With older children, the same difficulty arises which appears in all such attempts; we cannot exclude the personal factor.

W. S. Hunter, *Delayed Reaction in Animals and Children*, Behavior Monographs, 11 (1913), No. 6. Also *General Psychology*, 36.

then acting accordingly, we have rational behavior. Rational behavior thus involves insight.

We may well take as a point of departure Köhler's report on the building done by chimpanzees.²

Food was hung up out of reach and various boxes were scattered about. After sundry attempts at jumping for the food, a box was drawn beneath the food and mounted. After a great deal of trial-and-error, including attempts to use the experimenter or keeper as a footstool, a second box was piled on the first and eventually a structure of four boxes was built up. Learning from experience went on both directly and by imitation.

Now, here was intelligent behavior of rather a high order and the accumulation of intelligence. Learning bred learning. But there was no rational behavior. The boxes would fall down, partly because each was not placed properly on the one next below and partly because no consistent heed was paid to the principle that the boxes should be progressively smaller as the pile accumulated.

If, in the course of events, an ape had risen to the imaginative level and had communed with himself thus, "These boxes fall down, but if I place a smaller box on the one next below, the pile will not fall down; anyway, I will try it," there would have been rational behavior, based on insight or principle, as the outcome. He would not only have seen himself piling box on box and reaching for the food, but he would also have seen boxes following a sequence of cause and effect. "Communed with himself" is good, for it may shrewdly be conjectured that language based on the speech function, or an equivalent, is essential to ratiocination. Be that as it may, the appearance of concepts in consciousness is apparently the *sine qua non* of rational behavior.

² *Mentality of Apes*, chapter v.

A young child with his blocks at first behaves much the same as did the apes, but he quickly begins to see relations of the properties of things and behavior becomes more and more rational.

Thus, rational behavior is intelligent behavior, but not all intelligent behavior is rational. Intelligence is, of course, the outcome in both kinds of behavior, but that which arises out of the rational solution of problems is manifestly of the higher order in that it is immensely more comprehensive and economical than is learning from trial-and-error, whether the latter be through direct experience or carried on at the imaginative level. In other words, a single insight will produce intelligence over a field which trial-and-error might never cover, for lack of time.

Nevertheless, both the individual and the race must wait for ideas to dawn. The principle of fortunate variation still holds. If we picture an adult but extremely unsophisticated man standing before the pile of boxes, it might be a long time before he would see through the puzzle, even though his adaptive capacity were entirely normal. But having once got the idea, he can generalize and see that it applies, not only to these boxes, but to all boxes similarly situated, not only to piles of boxes, but to multitudes of similar situations. In due season he will coin some such word as "statics" and apply it to a branch of organized science.

Thus it is that progress in racial adjustment to those aspects of the world which require understanding is at first slow and then more and more rapid.

Rational, non-rational, and irrational. The contrast between rational and non-rational behavior is doubtless apparent. Trial-and-error is intelligent behavior, provided the individual learns from it, but it is not rational.

Instinctive or unlearned behavior is neither intelligent nor rational. Behavior based on ideals of value is non-rational. An example of the latter is suggested by the maxim, "honesty is the best policy." The maxim calls for behavior which is strictly rational, and yet the whole fabric of society would break down if all men were guided in their dealings with each other only by reason. An ideal is required which transcends reason.

On the other hand, conditioned behavior at the human level is irrational, for the very condition makes the individual follow a course which is contrary to reason, in situations in which reason is necessary. Behavior based on bad reasoning is irrational, for it treats as sequence of cause and effect what is not cause and effect, or else it puts properties together which do not cohere.

When the behavior of an individual becomes consistently irrational, he is abnormal. We call him insane.

In education. The educational process evidently relies very heavily on rational behavior, and the outcome is that whole field of personal adjustment which is the realm of the sciences. But here, as elsewhere, learning breeds learning. Man in infancy is not a rational being, but is only the possessor of an organism which makes rational life possible. Sentimentality frequently proclaims that all men are rational. That is not true. Some men become rational. Whether they do or do not depends on the progress and outcome of education.

It is frequently said that schools must teach their pupils to reason. That is true enough, provided it means only that schools must provide pupils with experience out of which learning can be built up on which rational behavior can be founded, and further provide them with (1) the systems of reasoning which organized science ex-

pounds and (2) the critique of valid reasoning which is contained in grammar and logic.

It is not true if what is meant is that schools should train some mythical faculty known as "reason."

Cultural behavior

A distinction seldom noted is that which must be drawn between intelligent and rational behavior on the one hand and cultural behavior on the other, and yet by far the greater part of the behavior of fully civilized man is cultural.

In our account of the apes busy with their boxes, we have seen trial-and-error resulting in some intelligence. We have also seen that if they had been able to see the relationships of things and had observed broader applications, the result would have been rational behavior.

Now, if an unheard-of ape possessed of embryonic qualities of statesmanship had been able to teach all the little apes how to pile up boxes in order to reach bananas hanging out of reach so that eventually all the tribe from generation to generation learned the trick from their predecessors, the result would have been cultural behavior. Incidentally, it could not have happened unless ape language and ape families or schools had appeared.

Again, if an ape along the line somewhere had introduced a system of whys and wherefores, so that all the rising generations would learn that you must pile the boxes evenly and decrease the size of the boxes as you increase the height of the pile, and that relatively flat boxes are better than square ones, *because...*, then cultural behavior would have risen to rather a high level, about as high as the greater part of humanity has ever yet reached.

Finally, if another ape still later on had been able to write a book, or utilize some other means of cultural transmission, expounding a set of principles which apply not only to piling up boxes, but to a great many other similar practical situations as well, the scientific level of cultural behavior would have been reached. Not only a method of procedure but a system of thinking would have become part of the cultural capital.

All this is intelligent, rational, cultural behavior, but, as we have seen, Man goes beyond that and exhibits a cultural behavior based on ideals of taste, morality, and volition as well as on intelligence.

III

APPETITE

Reflex behavior is adaptive behavior and so is tropism. The function is current adjustment to a current situation — that is, adaptive response. Both, however, are purely physiological; they operate entirely without reference to consciousness.

Behavior in response to native adjustment, instinct proper, is adaptive behavior, and so is what we have called organic behavior or impulse. These apparently operate at the level of consciousness, or at least what is consciousness in us, but neither intelligence, reason, nor culture is directly involved. The last three terms are descriptive of behavior, but not of processes within the organism. They would not arise, however, apart from the organic processes with which this chapter is particularly concerned.

In the last chapter, in our study of cerebral processes, we made much of the switchboard analogy. We now come to a series of processes in respect to which the analogy

is that of the generator rather than switchboard. The first of these with which we shall deal is *appetite*.

The ground plan of evolution can be said to be the perpetuation of the species. Two factors are involved, preservation of the individual until he or she can take part in procreation and thereafter nurture the young, and a guaranty that the individuals of the two sexes will thus take part. Here is perhaps the fundamental condition of life and Nature takes no chances. Out of this condition arise certain organic drives and the most comprehensive is that with which this section has to deal.

At the level of consciousness

In the lowest forms of life, preservation of the individual is relatively unimportant, for the process under which the perpetuation of the species goes on produces many times the number of necessary individuals. Professor Jordan tells us that, if all individuals survived, a single bacterium might produce something after the order of three hundred billion descendants in two days. Evidently the appetites are of little import here. Nor is it likely that reproduction entails appetite when the latter is simply division of the parent into two individuals. In short, for a long way up the scale self-preservation is of little consequence and reproduction is fully attended to by physiological process pure and simple. Doubtless there may be physiological action which much later in organic evolution becomes the basis of appetite, but so long as simple cell division or chance meeting with the opposite sex suffices, there is no occasion for appetite or for consciousness.

As soon, however, as the individual becomes relatively more important and as soon as reproduction requires

search for the opposite sex, appetite and consciousness become manifest until in Man they are at the maximum, at least in range.

Hunger and thirst

The term "appetite" is taken from the word which in common use is applied to desire for food. The need of the organism for replenishment of its supplies of energy and tissue-building material and water builds up a powerful adaptive drive in creatures which have to earn their living. There is no question of philosophizing about it and going through a process of ratiocination like this, "I have present in consciousness a feeling which we are told is the signal that my body requires food. I infer that if I do not eat I shall die. But after all is life worth living? I wonder." Nature takes no chances with philosophy — at least not until it is safe to do so. Appetite is imperious, and if the individual can get food he will get it, even if he has to fight for it.

Now it is important to distinguish between hunger and appetite as connected with food and drink. Hunger is physical need; appetite is psychical correlate. There may be, indeed commonly is, appetite without hunger, and there may be hunger without appetite. Our concern is with the principle that in the higher organisms, certainly in Man, it is appetite which is the important adaptive process and not hunger.¹

Sex

When the sex organs are ready to function, another bodily need arises. Again Nature is taking no chances.

¹ For discussion, see A. J. Carlson, *The Control of Hunger in Health and Disease*, 1916. See also W. B. Cannon, *The Wisdom of the Body*, chapter on hunger and thirst.

Appetite becomes imperious, and the male will have some member of the opposite sex for his mate, even if he has to fight for her. Doubtless the appetite is capable of sublimation and with that we shall presently have to do, but, be that as it may, the appetite seems to start life as an organic requirement.

Physical growth

A third set of these bodily needs centers about the necessity of growth, especially in vigorous childhood and youth. Who has not watched with amazement the unceasing activity of children? They run, jump, climb, and go through endless contortions of body, limbs, and voice. Their activities would rapidly exhaust an adult in the prime of life. Why do they do it? Well, they like it. So they do, and liking is only the affective coloring of appetite. Appetite is the conscious equivalent of bodily need. Bodily need is in nerves and muscles founded on the necessity of growth and rejuvenation of tissue throughout a great part of life.

These three manifestations of appetite as based unmistakably on organic requirement are only the most conspicuous manifestations of similar drives to outward adaptive response. Appetite is a process and not an organ; nevertheless, it is a process and not merely a mode of behavior. It is a mistake to fall into the habit of listing all the forms of organic requirement we can think of and thus attempting to form a corresponding list of appetites. Generally speaking, any need which requires adaptive response will set up an equivalent in consciousness which will classify as being in the nature of appetency, albeit we do not speak of them all as appetites. The most conspicuous is, of course, *pain*.

Pain

While pain is rarely noted as an example of appetite, it is, viewed from the organismic standpoint, precisely on a par with the major manifestations which we have discussed. It is a signal in consciousness of a bodily need and it leads to adaptive response, quite apart from intelligence, reason, or ideal. More than that, like hunger and sex, it is specific. Crile, for instance, has shown that pain appears when pain will serve adaptive need. That is true in general of internal maladies where there is required cessation of bodily activity or when perhaps outward effort to relieve pain would lessen the danger. Thus, infections are ordinarily painful, because the cessation of muscular activity favors the localization of infection. Some other diseases are not painful, because no response of the body as a whole would do any good. Some areas of the body are richly and others poorly supplied with neural pain endings, and in general those parts which are richly supplied are those in which there is the greatest peril of injury in the ordinary circumstances of life.¹

All this would have little more than a medical significance were it not for the principle which we have now several times met of continuous elevation of adaptive process, adaptive method remaining the same. In brief, the process which we recognize as pain in respect to bodily needs appears at the higher affective levels, to which we shall presently turn our attention, as discomfort, dissatisfaction, fear, anxiety, grief — what not.

Curiosity

A form of appetite which appears far down in the

¹ See G. W. Crile, *Man an Adaptive Mechanism*, chapter xiii.

animal series is what we know as curiosity, the desire "to find out about" the unaccustomed, the novel. The evolutionary significance is obvious; it pays to account for things. In Man, the very possibility of certain aspects of education rests on the appetite. Nevertheless, it is a crude aspect of original nature, and in the higher reaches of personal development adaptation depends far more on *interest*, and interests are learned.

Self

A host of manifestations of appetite center in self, and these are beyond compare the drives which make or mar the individual in his adjustment to the world in which he must live. It is the field in which Nature has retired to a corner and looks glumly on, ready to exact the pains and penalties of maladjustment, but powerless to constrain the individual or hold him in restraint. It is extremely difficult for the individual to deny the urgency of the bodily needs, and yet they are limited, but he may be willful to almost any extent, or, as we sometimes say, *egoistic*.

The almost endless manifestations of self-appetite, of course, tend to keep pace with the increasing importance of the individual in the scheme of affairs. How far down in the scale of living creatures self-consciousness appears it is no part of our need to inquire. Perhaps as good an index as we can find is susceptibility to *insult*, for here we have a manifest distinction between peril to bodily survival and peril to self as implying something more than bodily survival. As Judge Holmes once put it in a famous chapter, "even a dog distinguishes between being stumbled over and being kicked."

Self-appetite appears as self-assertion, determination to

have one's own way regardless of others, resistance to insult, in a word, vanity; but it also appears as the basis of interest, of the higher feelings, and probably of all meaning. Just as hunger may run into gluttony and sex into debauchery and the growth-appetite into needless and meaningless love of bodily exercise, so may self-appetite run into nauseating forms of the gratification of appetite, feeding self-love.

Man's civilization and his culture have so far freed him from the orderly natural forms of control in intimate contact with reality that all of his appetites, apart from education, tend to run wild; and of none of them is this more patently true than it is of those which center about self. Hunger is checked by satiety, sex by organic periodicity and the necessity of agreement between two individuals, bodily exercise by exhaustion; but there is no natural restraint on egoism. There are few animals other than humans which normally kill for the pleasure of killing and none in which this form of gratification of appetite goes to anything like the lengths to which it goes in Man.

Scope of self. Self starts, indeed, in the individuality of body, not as a bodily function, but as consciousness of distinction between the body with which self is connected and other bodies. It is thus a higher-level expression of the fundamental natural law of survival as a factor in evolution.

But self expands into all that is intimately related to individuality and we thus have the fundamental fact of *interest*, not the affect or feeling with which we are concerned in teaching, but the fact which lies behind the feeling. And so the infant's belongings become a part of him. Later on, this set of interests becomes property.

In due season, family and friends, especially the former, become so vital a part of self that appetite centered in them actually overrides survival. Self expands into community, party, and nation; and finally into ideals, principles, and scientific conviction. Normal men who will primitively fight enemies who assail their bodily survival will in the end fight those who assail their ideals and beliefs, even their scientific convictions. Thus the law of variation and survival is lifted to what is perhaps its highest level of manifestation.

We are, however, concerned with appetite and not primarily with the concept of self. Suffice it to have noted how wide is the range over which self-appetite can ride. It is by far the most influential factor in the process of education. It is not too much to say that self-appetite is the chief factor with which the schoolmaster has to reckon in formulating and laying out the course of instruction and the statesman in formulating and administering programs of social betterment.

Derivative terms. The books make much of such terms as "desire," "wish," "yearning," "longing," "pleasure," and the like, as if these were separable processes. Indeed, a whole system of psychiatry has been built on hypotheses which assume these manifestations to be processes in themselves.

Desire, wish, and their company are merely descriptive of manifestations of appetite, sublimated or unsublimated as the case may be, but they are not organic processes in themselves.

Educational implications — sublimation

We sometimes hear it said that "people's passions should be educated." Strictly speaking, what is meant is that

appetite should be educated. In what sense and how far is such an instructional process possible?

If what is meant is that appetite can in some way be whipped into subjection as an unruly horse or dog is whipped into subjection by hope of reward or fear of punishment, then no such procedure can result in educational development. The only effect will be that the individual will either rebound as soon as pressure is removed or else a perverted learning product, such perhaps as cowardice or profound lack of confidence, will become established. Such, that is, will be the tendency, and the tendency will become an actuality in all but a small percentage of cases in which the factor of fortunate variation may operate.

True enough, a volitional structure can perhaps be built up so that the individual will appear to hold his passions under the control of a powerful Will, but psychopathology has abundant evidence to show that the result will tend to be either spurious personality or else emotional outbreaks and perhaps actual insanity.

No, the educational process consists in changing the direction or incidence of appetite so that the individual ceases to desire what primitive appetite drove him to desire. The *adjustment process* at work is *sublimation*, one which is parallel to the adjustment process based on reasoning which we have already met and the outcome of which is rational intelligence. We may similarly name the outcome of sublimation *sentiment*, which finds expression in ideals.

Now, nearly all mature people have experienced this process of sublimation. They have it in mind when they say, "I no longer like what I did ten years ago." Few of us care for the things which concerned us mightily

when we were children. Perhaps the most notable instance is the transition from the rampant egoism of childhood to the altruism of mature life. The healthy ten-year-old rides rough shod over even the most trivial rights of others and glories in the action. Ten years later, if he has gone through right educational development, he will blush at the thought of having unwittingly offended. Sublimation has taken place, but self-appetite is as powerful in one case as in the other. In childhood, he has satisfaction in having his own way; in maturity, self may be affronted by its own acts.

The mature civilized individual still operates under the same adaptive drives as the child, but they have been sublimated to higher levels. Hunger has been refined; sex appears as romantic regard and feeling of sanctity; self appears as ambition, widespread interest, patriotism, self-respect. Gluttony, debauchery, crude self-seeking disgust one.

Manifestations of appetite often mistaken for instinct. One characteristic of appetite is that, other things being equal, it will always tend to manifest itself in much the same fashion in similar situations in all individuals. Thus, all normal individuals desire to keep on living and they respond in much the same manner in the presence of peril. At bottom the ways of a man with a maid are proverbial, and the reverse is equally so. Most people and many of the lower animals desire the companionship of their kind. Most of the carnivora do not — no desire to share a kill. Mothers commonly show one kind of yearning over their children, and fathers a similar but somewhat different kind.

All these are manifestations of appetite. The common type of behavior leads people to conclude that "there

must be an instinct for that," and so we have a long list of putative instincts ranging from self-preservation to gregariousness and parental love. The method of thinking is much like that of the old phrenologists. The simpler explanation, and the one which comports better with all we know of organismic structure and function, is that all such phenomena are manifestations of appetite in the same or similar situations.

IV

TEMPERAMENT

Instinct, impulse, appetite — all these are instances of what is sometimes called original nature in its psychical aspect. Next is *temperament*.

Perhaps the most impressive thing about organisms, whether they be viewed from the standpoint of common-sense observation or from that of critical scientific technique, is variety. It is sometimes said that no two are exactly alike. When we observe creatures which belong to the same species and have regard to individual organisms as wholes, we still encounter variety in almost endless complexity. In one respect, we say that here is unlikeness in *temperament* or *disposition*. This one is high-strung and ready to go off under the slightest stimulus; his companion is slow but sure. One seems to have a predilection toward certain kinds of learning and another is about equally good in all subjects. One is fiery and tempery and his brother is calm and imperturbable. These are temperamental differences. They are kindred to what the medical man calls constitutional differences. Constitution means, I suppose, the way an individual is put together as individual.¹

¹ See "Temperament and Bodily Constitution," F. S. Hammett in *Comparative Psychology*, 1921, 1, 489-494.

Temperament is frequently confused with personality and the reverse. Indeed, it is not always easy to distinguish precisely between what is really temperamental and what is personal, but for most purposes it is easy enough to decide. A spoiled child will often exhibit what looks like an unfortunate temperamental trait, when in fact his behavior is traceable to bad bringing-up. Artists frequently claim unusual consideration on the ground that they possess artistic temperament and genius, whereas all that ails them is lack of discipline. These are illustrations of traits which are traceable to inadequate personality rather than to organic temperament, to failure in education rather than to original nature.

Temperament as health pattern

It is matter of common observation that on days when we do not feel quite well, our activity is below par, whether the latter be technically a matter of adaptive response or of adaptive change — that is, learning. Physiologists know well enough what is the matter. Elimination is bad and the body is accumulating poison, or circulation is impaired and consciousness is dulled, or some other internal function is out of order — action of the liver, perhaps — and disorder is reflected in feeling tone, the way we look at the world. That is variable experience in the individual from day to day; it is not chronic.

But in some people such conditions are chronic. The internal organism is put together that way.

As adaptive pattern

Closely parallel is what may be called "adaptive pattern," the quality of nerve tissue and of the organs which supply chemical reinforcement, irritability of the organism as a whole. Relatively slight stimulus will set

up adaptive response, or rather response which ought to be adaptive, but which more often appears only as emotional outbreak. These are the people who are most commonly referred to when we use the word "temperamental." The organic condition which they reveal is a chronic manifestation of an organismic process which is itself normal and useful. We see it notably in emergency reactions in the presence of peril. The eyes dilate and all the senses become similarly hyperacute, bodily tonus in general is heightened, threshold is lowered, the individual is set on a hair trigger and is ready to go into instant action. But the organisms of temperamental folk are apt to treat the occasions of routine existence as emergencies.

Curiously enough, common folk have stood in some awe of these individuals all the way from primitive times. The savage thought them to be possessed of supernatural spirits. The modern sometimes thinks they are endowed with genius. Not so; temperament is here a handicap and not an asset. And yet there is some excuse for misapprehension, for this adaptive instability is easily mistaken for the vigorous adaptive capacity which goes probably with steep metabolic gradients. We shall be interested in the latter in connection with our study of consciousness. Suffice it to say that there is all the difference in the world between mere adaptive instability and the vigorous activity of our world-shakers, admitting, however, that the two characteristics may sometimes be combined in the same person.

As appetite pattern

As we have seen, some of the appetites arise from organic physical functions, notably the requirements of

food, sex, and physical growth. It is scarcely to be denied that these vary greatly from individual to individual, so much so that we commonly characterize some men and women as "lusty" or "passionate." Thus, relative intensity of appetite always tends to form temperamental patterns which characterize individuals and modify adaptive tendencies if not capacity, whether the latter appear as capacity for adaptive response or for adaptive change.

Many of the psychical differences between the sexes are probably of this order. The male is organized for combat, for mate-seeking, for vigorous forthputting activity; the female for the opposite, or nearly that. Hence, appetitive pattern varies greatly as between male and female and in the end the fabric of personality, in so far as the latter develops apart from systematic instruction.

In general

The foregoing will serve as illustrative of what we mean by temperament and to some extent will explain the organic bases thereof. But these are only illustrations. It cannot be pretended that they exhaust the well-nigh infinite possibilities of differences in what must be understood as temperamental pattern as marked off from instinct and appetite on the one hand and personality on the other.

In the educational process

How far can temperament proper be modified by instructional process? Probably not at all. But let us see.

It is perhaps helpful to find an analogy in an organic condition with which all older people were distressingly familiar in their childhood days and of which everybody has heard a great deal. I refer to tuberculosis, especially pulmonary tuberculosis, old-fashioned consumption.

Time was when this malady was a great deal more of a scourge than it is today. It seemed to run in families and we were fatalistic about it. You inherited consumption; that was that. The advancement of science clarified our views. It still remained true that transmission in the germ plasm had something to do with it, but it came to be seen that what was inherited was organic susceptibility to the causative bacillus and not the disease itself. It came to be known further that most people are infected at one time or another and that their physiological defenses are adequate to the throwing-off of the infection. People in whose family backgrounds there was no taint of susceptibility might still contract the disease and in a state of lowered defenses die of it. Finally, people who indubitably inherited organic susceptibility might be protected: first, by avoidance so far as possible of exposure to infection; and, second, by building up their general health.

So it is with untoward temperamental traits.

First of all, those which are founded on chronic internal maladjustment may be abolished by medical or surgical treatment which cures the maladjustments themselves; that is, by building up general health.

Second, those which are traceable to perverse adaptive pattern may be thwarted in their ill effects by something like educational sanitation.

The extreme form here is, I suppose, the neurotic constitution, or temperament, which may likely enough lead to insanity. Here is where the parallel to tuberculosis is closest, for very often this type of temperament runs in families. Nevertheless, such people can be protected by removing so far as possible the occasions of the outbursts, which grow by what they feed upon. Many a

person who ought by all the laws of heredity to have become insane in youth or middle age has been thus so protected that he or she has lived a normal and happy life.

In the less extreme cases, however, the nervous folk are protected by effective general education. In the genuinely cultivated person, mature on the sides of intellect and taste, morals and volitions, the occasions for outburst are greatly lessened. He ceases to carry a chip on his shoulder all the time, largely because he is sure of himself and less susceptible to insult. Self-appetite has largely been sublimated. It does not follow that there has been brought about any change in temperament. On occasion, the educated exhibit outbreaks as do the uneducated, but they do it less often. Even Saint Paul went to pieces before the high priest.

Where temperament is manifested as a pattern of varying intensities of appetite, the educational process does sublimate appetite or else there is no effective education at all. In so far as appetite is actually thus sublimated, the occasion of anti-social behavior is removed and so are obstacles to personal integration, but it does not follow that appetite itself is abolished.

And so, strictly speaking, there is no such thing as "educating the temperament," of "educating the emotions," an expression used by some writers who do not distinguish critically between appetite and emotion. But there are such things as applying medical treatment to the removal of bodily ailments which are manifested as temperament, and protecting neurotic individuals from experiences which are likely to make mischief. Furthermore, general education, which we recognize as the building of personality in adjustment to external and internal circumstance, is itself calculated to decrease the likelihood

of anti-social and personally unwholesome behavior founded on unstable temperament.

V

AFFECT — THE FEELINGS

The content in consciousness which arises from the drives of appetite, and especially the appetites which cluster about the self, is known as "affect," or "affective experience," or in common language, the feelings. Affect must not be confounded with emotion. Emotion is affect, but not all affects are emotion.

"As he thinketh in his heart, so is he." In scientific terms, personality is in the last analysis a matter of affective adjustment. Not only is adaptive response to a novel situation made on grounds of what we *feel* to be right, but adaptive change or learning is made through rise of the attitudes which yield satisfaction. Technically, meaning is validated in terms of affective equilibrium. Here is then the fundamental energetics of adjustment.

Terms

A great deal of water has gone under the bridges since the day when psychologists wrote treatises under such titles as "The Emotions" and "The Will." The results of physiological investigation and the fruits of psychiatric practice have suggested revisions and refinements of our views on the whole general subject of the emotions. I think it will be useful to have before us, as concretely as possible, distinctions in significance between the three terms, appetite, affect, and emotion, for our thinking tends to fall into confusion for failure to make such distinction.

Now, as we have seen, appetite is the dynamic member of the trio, the drive. Apart from appetite there would

be no feelings of any sort. Appetite is satisfied when the feelings which arise from appetitive urge are brought into equilibrium by action which discharges the urge. If discharge of the urge of appetite entails unhappy consequences, the recourse is to sublimation, so that the particular urge no longer exists. The product of sublimation is personal adaptive accretion and it is rightly in the form of social adjustment.

In this connection, we must for the moment return to our study of physiological aspect. It will be remembered that we identified in the last chapter the process of reinforcement, extensive visceral changes which serve to enable the organism to meet an emergency. Here is where physiological researches have been particularly illuminating.

It has for a long time been known that affective experience in consciousness is accompanied by visceral changes, notably by changes in blood pressure and the consequent redistribution of blood supply. The researches of Cannon, Crile, and others have shown that similar changes in chemical activity occur. The work in this field best known to the general reader is perhaps Cannon's *Bodily Changes in Pain, Hunger, Fear, and Rage*. We know that in the presence of any kind of situation to which response must be made, we get two sets of phenomena, one of which appears immediately in consciousness and the other via the pressure-gauges and test-tubes of the laboratory investigator.

Now, when an urge toward adaptive response arises, be it from some of the bodily appetites or from the vastly greater range of the appetites which center about the self and its preservation and integrity, affective disequilibrium occurs and the dynamics of the situation require equi-

librium. There are but two methods by which equilibrium can be restored. It will be restored actually by discharge of the urge in appropriate action or it may be discharged by the formation of a new attitude. It will perhaps be well to consider concrete illustrations.

A powerful affect arises when one is hungry, powerful because it is related to the most primitive appetite of all, that which makes for bodily survival. Normally it will be discharged by finding food and eating it. Suppose, however, that no food can be found and starvation begins. Actual frenzy may result as the consequence of continued and increasing affective disequilibrium. On the other hand, the sufferer may report that he no longer feels hungry; he is reconciled. Affect is discharged by the establishment of attitude. The body needs food more than ever and yet no sensations come through. Here is perhaps a most notable evidence of the unity of the organism; in the presence of reconciliation the normal sensations are not entertained. Where the new attitude does not appear, the sufferer's sensations continue to pile up disequilibrium until he lapses into madness.

Cannon quotes a remarkable case of similar adjustment in a man who supposed he was about to be executed. Survival appetite would normally lead to frantic efforts at escape, but these were impossible. Emotional stress piled up and severe bodily symptoms appeared. Presently he resolved to die like a man, whereupon both emotional and bodily symptoms disappeared. Affective disequilibrium was discharged by the formation of a new attitude.¹

Conflict. But our hungry man may steal. If he has

¹ See *The Wisdom of the Body*, 69, quoting from H. J. Howard, *Ten Weeks with Chinese Bandits*.

not moral compunctions, equilibrium will be restored. But suppose he has already developed the genuine personal adaptation which distinguishes between mine and thine. In that case, his theft will lead to remorse and leave a cankering sore in his whole affective system, a state of more or less chronic disequilibrium. This is the condition which psychopathologists describe as "conflict," and it is the basis of psychoanalytic practice. Conflict arises because the individual's volitional structure has not kept pace with that of his morality. Personality may become so unbalanced that well-nigh every important response leads to some kind of conflict and the individual becomes merely a morbid patient in a sanitarium.

Conversely, the individual's perverse adaptive responses may go happily on with no danger of conflict at all, since personality in him is immature and uncivilized. In that case, it is society which goes to the sanitarium, provided there are enough such individuals.

Let us pass to the domain of self.

Self. A small boy encounters what is apprehended as an insult, an assault on his self-respect. He "sees red." If he should introspect and report, he would say that he was angry. He lunges out in combat and feels better. Equilibrium is restored and the chemicals poured into the blood stream to meet the primitive emergency have been oxidized. In ten minutes the two boys are playing together as if nothing had happened, and likely enough physical growth has been stimulated.

But maybe the combat has resulted in an obvious "licking" for one of the boys, instead of a draw as is usually the case with these recess fights. That way danger lies, for disequilibrium has been made worse. It may be restored through the formation of a new and

useful attitude; the boy learns to "take a licking" and has thus become a "sport." Or it may perversely be restored by a different change; the boy becomes a coward and refuses to assert himself. Thus forms a perverse, structural, personal adaptation which tends to color his whole life and render him liable to constant, and it may be chronic, affective disequilibrium. That is the road to psychoneurosis, for when there is present in the viscera a chronic load of unoxidized emergency products, the whole physical organism will more or less be thrown out of integration.

But our boy grows up by taking on a myriad of new attitudes, some of them being structural elements in personality. Self expands to cover a great many interests. The likelihood that it can be insulted grows correspondingly less, the level at which grievous insult can occur rises, and adaptability — that is to say, likelihood that new and genuine attitudes will form — increases. But that is not to say that appetite grows less; the "self-less" individual is a myth. If any such really existed, he would be a personal nullity. *Selfishness* is not the opposite of *self-lessness*. It is rather the infantile condition of personality in which primitive self-appetite has not been sublimated.

Let us take a step upward to the level at which we are accustomed to think that no affect exists, namely, that of intellectual activity, ranging from the trial-and-error of constructive imagination to thinking out abstruse problems in terms of established principle.

How does one know that two and two make four? That if a is equal to b and b equal to c , then c must be equal to a ? Why do you keep on with a knotty problem which concerns you deeply until you have reached a solu-

tion? In what does reaching a solution consist? Why do people get jaded and perhaps worn out by mental activity?

In the end the answer is that you feel that two and two are four, that any other treatment of the syllogism would be distressing, that leaving a problem unsolved worries one, and reaching a solution relieves one.

Quite true; the principle of restoration of affective equilibrium applies here as truly as it does in the relief of hunger or the erasing of insult. The laboratory investigator with his balances and gauges and other apparatus can trace the effects of the bodily reinforcement processes in the case of what we call thinking as truly as he can in the case of physical combat. Subjectively, solution comes when affective equilibrium is reached, when no further facts or principles appear in consciousness to upset equilibrium. Objectively, it is reached when response is the right response to conditions which are external and quite apart from the individual's existence. If it were not for the fact that cultural evolution has reached the point at which all normal men find the same affective equilibrium in the presence of the same problems in most of the concerns of the daily life, we should live in an intellectual chaos. If I reach conclusions which satisfy me with respect to some of the issues which are as yet far from settled and my neighbors are not satisfied by what satisfies me, we agree to differ. But if I assert that I can find no comfort in the equation $2 + 2 = 4$, then they take measures to lock me up, lest I soon exhibit tendencies to find no affective equilibrium in contemplating the continued existence of my neighbor.

Affect here exists in terms of self and what concerns self. Hence *interest*. *Meaning*, which is at the basis of

all intellectual life, is validated in terms of affective equilibrium, that which preserves the integrity of self. That has meaning which satisfies us. It follows that the equilibration of affect in new attitudes of understanding is in method no different from equilibration in taking on new attitudes in sportsmanship. The learning process is different; one is through rationalization and the other through sublimation. Both rest on self-appetite and self-appetite in the mature personality centers on integrity of self, on self-respect. Herein is mastery. "As he thinketh in his heart, so is he."¹

Wishful thinking. The process which has just been described makes possible perverse decisions which are called "wishful thinking" or decisions in which the "wish is father to the thought." Instead of affective equilibrium being restored in terms of external fact and principle, these are apprehended to suit the color of affective disequilibrium. Children will sometimes exhibit behavior in which their desires are in patent disharmony with the facts and equilibrium is restored by the trite expedient "Let's *play* it is so." The world goes comfortably on. Older people will seldom do just that, but they will accomplish the equivalent by escaping into a world of mysticism in which anything can be true. This childish trait in immature personality is in all the ages one of the chief opportunities of the charlatan, the quack, the demagogue. Homer was aware of it and so was Moses. Aristophanes and Juvenal mocked it. We still find it in the politician, the pseudo-scientist, and literary prosti-

¹ For an interesting comment on the doctrine of equilibrium as constituting the fundamental dynamics of adaptive processes, see Cannon's Introduction to *Wisdom of the Body*, especially his quotation from Fredericq and his further suggestion that the general principle which he develops as *homeostasis* may be of much wider application than the physiological process which he elaborates.

tute of our own time. One and all they appeal to people's desires rather than to the truth.

Of course, wishful thinking is conspicuously an attribute of spurious personality. People mature out of it by becoming genuine, and still more by taking on the attitudes which are found in superior intellectual adjustment and especially in the laws which govern ratiocination — that is to say, logic. Even so, none of us ever escapes from affective disequilibrium as the psychological foundation of thought; rather do we become the kind of persons in whom disequilibrium will not get set up save in terms of external reality. We come to desire the truth instead of desiring that truth shall be thus and so.

Fatigue. It is sometimes said that we get wearied with thought, and so we do. But in what sense?

It used to be said that thinking uses up brain cells. Not so. The purely mental process which we call thinking is about as immaterial as anything could possibly be. In order for thinking to go on, however, there must be a rise in that intensity of consciousness which we call attention, and, as we shall presently see, intensity of consciousness is the psychological correlate of increased metabolism in the region of head dominance. Increased metabolism rests on the reinforcement process, on appetite. Now, metabolism is a running-down process when activity is going on. If energy is exhausted faster than it is replenished on the building-up side, fatigue results. We do not use up brain cells or brain energy in thinking. The maintenance of the differential metabolism, at the head, in the bodily gradient, which is the physical condition of acute consciousness does run down the reserves of potential energy in the body as a whole. Such maintenance

does seem at least to alter the microscopic appearance of brain tissue as matter is converted into energy, but wear and tear arise from the maintenance of metabolic gradient under appetite and not from thinking.

Emotion

Emotion is affect, but not all affect is emotion. More facts and better understanding have enabled us to see important distinctions. Emotion may be said to be excess feeling.

Time was when emotion was looked upon as being at least an organic process if not an organ, in the form of a faculty. So it seemed right to try to identify and name the emotions after the fashion of chemical elements and then to go farther and set up emotional compounds something like chemical compounds, or perhaps to map out the resultant of various emotional ingredients according to the principle of the parallelogram of forces. A man is angry, but he is also afraid. Hence, his behavior will take the line of the resultant of these two forces. If we can measure both anger and fear, then we can plot the line of action and thus reach the desired end of all science by being able to predict behavior. Not so. Emotion is neither organ nor process, but state.

Further confusion resulted from failure to distinguish between appetite and emotion, and even between emotion and sentiment or ideal, which are learning products.

Emotion as excess feeling can perhaps be understood from the following illustrations.

In the case of our small boys in combat, emotion appears because from the evolutionary standpoint the situation is critical. Intense feeling arises because the organic reinforcement process, in both its physical and its psychical

aspects, must rise to a maximum. We call the content in consciousness anger. But as soon as combat is joined, anger tends to fade out into the bodily lust of fighting. It has often been noted that soldiers in battle seldom feel anger, at least nothing like what civilians at home feel. In the case of the latter, feeling piles up and up until it is equilibrated by cruel and riotous behavior or perhaps perverse attitudes. The latter are prone to become structural and to determine for generations the relations of two nations, long years after the events have passed into oblivion. Thus "war psychology."

When the situation is one of escape, we call the emotional content fear, but not all escapes involve fear. Individuals who have run away, either literally or metaphorically, are often laughed at when they profess that they felt no fear. "But you ran," they are told. The runner is frequently right; judgment indicated escape and affective imbalance was sufficient to secure escape, without becoming intensified to the level which we recognize as fear.

Where the situation is one of apprehension of future peril, we identify the emotional state as one of anxiety. If the problem which is foreseen is solved by imaginative or rational process, then anxiety as such fades out, but affective tension remains. We are alert.

Now, to repeat, we must not think of anger, fear, and anxiety as the names of organic processes. They are only names for the emotional content which is characteristic of certain kinds of situations. If these were the only kinds of situations which ever arose, then all emotional states could be identified as either anger, fear, or anxiety. But the human being meets all kinds of situations which are capable of generating affective excess, and we recog-

nize such forms as overflow of love, grief, horror, and many others. Sometimes, it seems as if in the process of equilibrating affective disturbance, the pendulum swings to imbalance in the opposite phase, as it were, and we experience relief, or its excess form, delight, and we often recover balance by "transports of delight."

People are sometimes said to be governed by their emotions rather than by intellect. The saying frequently mistakes appetite or even prejudice for emotion, and it frequently means that sentiment rules where the situation calls for reason; but still there is a good deal of truth in the saying in three senses.

In the first place, there may be physical paralysis of action. In sensitive organisms sudden emotional stress sometimes signifies that blood has been so rapidly drawn into the viscera and musculature that cerebral processes are halted, and the individual may even faint.

In the second place, excess feeling does on occasion so occupy the focus of attention that no mental processes proper have a chance to operate. The individual "runs in circles" or perhaps stands stock still, but does not faint. I have known pupils suddenly to drop from highly successful learning and progress almost to the opposite extreme, by reason of the fact that emotional content, usually anxiety or grief or "calf-love," had come to monopolize the focus of attention.

Thrill-hunting. In the third place, human beings, and apparently some of the lower animals, will often follow a perverse trend and cultivate emotion for its own sake, "thrill-hunting." A normal characteristic of childhood, this tendency explains a great deal of perverse behavior in adults. It is singularly apt to appear in religious excess and perversion, and it is the explanation of social

tendencies which some historians are fond of naming "emotional revivals." It obscures the normal mental processes because again the focus of attention is artificially swamped in excess feeling.

Now, in the process of cultural evolution, this thrill-hunting tendency has been utilized in the production of the records of emotional experience which constitute adjustment, normal and natural modes of application and discharge. We find them in family life at its best, in religion — especially in the great ethical religions — in biographical examples of noble living, in the beauties of nature and the fine arts. No doubt one of the reasons, perhaps the chief reason, for perverse thrill-hunting is utter meagerness of cultural resources in the seeker.

It would not be going very much too far to say that Nature abhors emotion: it is too dangerous, especially under the conditions which prevail in modern life.

We sometimes hear of creatures which die of fright. That is quite credible. In these days, we frequently hear physicians admonishing people who have weak hearts to avoid excitement. Any affect, as we have seen, is among other things accompanied by changes in circulation and it tends to throw a strain on the heart. Excess affect may easily impose a fatal strain. Chronic emotional stress tends to keep reinforcement processes at work and without normal consumption or discharge of their products. The result is at best ill health; it may be psychoneurosis and even insanity. In personal development, constant emotional strain tends powerfully to get discharged by the formation of attitudes which easily may become structural in character and thus contribute to personal maladjustment and imbalance; in a word, perverted ways of looking at life.

Now Nature provides safeguards for emotional excess in various ways.

In the first place, primitive occasion for emotional stress is in combat and bodily peril. The normal reaction is furious activity in either attack or flight. In either event, the reinforcement products in the organism, both physical and psychical, are discharged.

In the second place, emotional stress, apart from these primitive occasions, is apparently kept down by reactions such as laughing, weeping, and sundry manifestations of delight or the reverse. People become aware of the process of discharge when they discover that "having a good cry" has a tendency to assuage grief. It has been noted that an audience will sometimes burst into laughter in the presence of a stage thriller which depicts a sudden horror. There is no merriment, but emotional intensity is discharged by a reaction which is commonly related to quite a different feeling color. Children and young people laugh a great deal more than adults, largely because personality is immature and more situations are encountered which provoke emotional intensity. I have heard adolescents say that they "love to laugh," and that is doubtless an instance of the urge of bodily appetite.

This particular aspect of emotional discharge has large speculative possibilities in the direction of new attitudes which may form as adaptive changes, particularly in the broader cultural field as it is found in sense of humor and by that route in personal integration, and likewise in such social institutions as religion, literature, music, and the fine arts in general.

Finally, in extreme cases, Nature intervenes with various organic adaptive changes which operate as defense processes. This, for instance, was apparently the situa-

tion in many "shell-shock" cases during the war of 1914-18. A soldier, drawn perhaps from the ranks of highly protected urban life, would encounter the horrors of the trenches to the endurance of which personality had not been hardened. The result would be rapidly mounting undischarged emotional stress which if unrelieved would presently result in complete disintegration of the psychic organism. Relief was apt to come through amnesia, forgetfulness. The whole experience was blotted out from the memory system and along with it much of the individual's past career. Indeed, the whole field of emotional stress is the basis of the greater part of modern psychopathology. It is full of educational implications, but we shall have to leave the field to be cultivated by those who specialize in psychiatry, merely noting from point to point the contacts between psychiatry and the instruction of normal individuals.

Education of the emotions

A great deal of concern has in recent years been felt for the education of the emotions. Is education of the emotions a possibility? In the strict use of terms, I think not. We encounter here once more a misuse of terms which leads to fallacy in thinking and to bad practice in instruction. We have found it before in such expressions as "education of the brain," "education of appetite," "education of temperament." All such conceptions are part of the lingering ideology of formal discipline. If education of the emotions means some sort of a process of whipping them into shape, then there is no such thing.

On the other hand, right education — that is to say, development into mature, integrated, civilized personality — tends to remove the occasions for excess affect. Ad-

justment is achieved, and adaptive responses to external situations flow at the level of normal affective imbalance and restoration of equilibrium.

Thus, increasing intelligence goes far to remove dread of the environment, just as it goes far to sublimate the appetites. An illustration can be found in such an incident as the following. A party is touring in an automobile. All the members of the party can drive, but only one of them understands the mechanism to the degree that makes it possible to say that he is intelligent about the machine. Suddenly smoke begins to pour out from under the dashboard. Some of the party scream with fright. One of them rushes aimlessly about venting exclamations and demanding that something be done. The intelligent member observes the source of the smoke, sees at a glance what is the cause, quickly detaches a wire, and peace is restored. The understanding individual works at high affective tension, but he exhibits no emotional outburst. The illustration is an epitome of what increasing intelligence about the world does to reduce the occasions of excess emotion.

MacCurdy, in *Psychology of Emotion*, 59-60, says that he questioned a great many people touching their emotional experience in danger with uniform results, illustrated by the statements which follow:

(1) At the front, there would be no fear when a shell was coming provided the soldier knew what to do.

(2) When the man did not know what to do, fear would mount and mount and might paralyze all action.

Similarly, expanding taste in a familiarity with the cultural capital of the race yields satisfaction which operates to stabilize affective experience and still more does it operate to remove the occasions for perverse

thrill-hunting with all its deliberate running into danger.

Most of all, the elaboration of normal conduct structure, especially in its volitional aspect, enables the individual to meet with equanimity situations which would otherwise occasion emotional stress.

But all this is far from saying that education has modified one whit the organic processes which make emotional stress possible. The educated individual whose appetitive pattern renders him inclined to passionate outbursts will still be capable of high emotional stress. Another who is temperamentally unstable will be capable of going off at half-cock just as he always was. In both cases, however, right education makes it a great deal less likely that the appropriate stimuli will register.

VI

MENTAL PROCESSES

We are aware in ourselves of certain adaptive processes which we call sensation, perception, memory, imagination, and the like, and from their behavior infer that other people have similar experiences. This is the field in which the study of psychology has been predominantly interested and which for the sake of precision it is convenient to designate as the field of the mental processes proper. Our present concern is to consider the mental processes purely as serving adaptive functions and in relation to the other adaptive functions which we have hitherto considered. There is an abundant textbook and treatise literature dealing with mental processes, and doubtless most readers are more familiar with this literature than with that dealing with any other aspect of the adaptive organism. For our present needs, it will suffice to remind ourselves of the principal mental processes and thus form

a notion of their place in the functions of adaptive response and adaptive change.

Attention

It will perhaps be well to begin with noting what is not a process at all, but rather a state of consciousness, namely, *attention*, sometimes referred to as the focus of consciousness.

Whenever affective equilibrium is disturbed, consciousness becomes more acute. We shall see more clearly in the next section how that is. Much as is the case at the level of purely physical tropistic behavior, the products of immediate experience contend in the field of attention until a combination arises which will discharge affect. The period of activity may be brief, as it usually is in the case of organic as distinguished from personal behavior,¹ or it may be prolonged, as in the case of problem-solving at the level of intelligent or rational behavior. It may involve motor activity of some sort, as is usually the case in adaptive response, or it may involve affective discharge in the form of a new attitude or way of looking at life. It may be noted, however, that psychological investigation shows that what we are likely to believe is a prolonged attention condition is rather a series of waves of attentive intensity.

Sensation

Our primary contact with the external world forms through a process which is known as "sensation." Let us return to our experience with the traffic light.²

Red appears in consciousness. That is a sensation, the product of a sensory process. Red is what we call it.

¹ See page 163.

² See page 117.

Now there are innumerable sensations constantly appearing in consciousness, some of them, like this red, visual in origin, some of them auditory, others sensations of touch, taste, smell, and sensations arising from movements of the limbs and muscles. Others still come from the viscera and these are likely to be accompanied by painful affect.

But this one is red. What of it? There is a good deal of redness in the world. But this is a red light, and the red light brings us to:

Perception

Red light was no doubt originally just a red *thing*, and red things are percepts. It is commonly said that pure percepts can exist only in early infancy. Beyond that, percepts are really appercepts — that is to say, percepts determined by previous percepts. So what is present in my consciousness here is not red thing, but red light, and even red traffic light. I have seen red lights before. But this light would have no meaning or significance to me and hence would not influence behavior save for a string of other mental processes the products of which form a combination which discharges the affect set up when the red light flashes across my pathway. The first such process, the master of all, is *memory*, and here we have some untangling to do.

Memory

Memory is at bottom continuity of self. It appears as awareness that a past experience was experience of the same self which still has experiences. It is accompanied by a mild feeling of integrity arising, no doubt, out of self-appetite. It is sometimes said that no single ex-

perience of our lives is ever actually lost out of the memory, not even those which we are protected from *recalling* by defensive amnesia. The statement will probably hardly hold water unless we define experience, as we very well may, as occurrences which have been accompanied by affective process. The evidence for practical indestructibility of such memory content is contained largely in the disclosures of psychiatric practice in which recall is induced artificially and systematically, sometimes under hypnosis, sometimes by laboriously exploring the association system and in that way penetrating to levels which are beyond any probable awakening through associations formed out of current experience.

It is well to note that recent memory must not be confounded with attention-span. One sometimes starts writing or reading a long and involved sentence and before he has finished "forgets" how the sentence began. Memory is not involved. The sentence has passed beyond the span of attention.

Recall. When people say "I have forgotten," they are apt to mean that there is no memory content with respect to the experience to which appeal is made. "Memory is a blank." Not so. They do not recall. And yet the amateur psychoanalyst who is in conversation, if he is at all persistent, will usually exclaim, "Why, you remember..." and will thus often succeed in eliciting the forgotten episode by association. So most people mistake memory for recall. When a person says "I do not recall," he speaks accurately.

The normal process of recall is *association*. A given experience tends to call up in consciousness the whole system of experiences, be they actual in the form of percepts or virtual in the form of images, which can be

associated with the present experience. If outward adaptive response or inward adaptive change is required by the situation, the set of associations which will discharge the existing affect will appear in the focus of attention. If the situation is not critical, reverie takes place — that is, an endless chain of associations occurs as content in consciousness drifts from one phase to another.

The numerous devices advertised as “aids to memory” or “memory training,” in so far as they are worth anything at all, are simply mnemonics — that is to say, artificial association methods. Most of us devise such for ourselves. Who has not, in seeking for a name, allowed the letters of the alphabet to drift slowly through consciousness? In such cases, when a particular letter is reached, it will often call up the name of which it is the initial.

Of course there is no such thing as training the memory, for the memory is neither a faculty nor an organ, but only the name given to an adaptive process.

Established associations. Both in the common notions of schoolcraft and in some of the writings, we sometimes encounter false notions of recall, particularly in such school arts as spelling, the numerical tables, names of the capitals of states, and sundry similar matters. Such schoolroom processes are apt to be spoken of as “memorizing.”

Now recall proper requires content in the focus of consciousness, and these things require just the reverse, in order to be of any service at all.

As I am writing these words, attention is concerned wholly with the development of the argument. Words and spellings flow off the end of my pen and I am altogether unaware of the mechanics of writing, including the

spelling of words. If I stopped and allowed conscious recall to operate, I should begin to be doubtful. Thus am I operating in a field which has little or nothing to do with memory, namely, that of language. Spelling, which in my case probably started as a series of forced and established associations, has become incorporated in language which is now an integral part of my personality, a learning product.

Generally speaking, specific associations, which occur together frequently enough, become established and pass out of the domain of memory into that of personality. In systematic instructional practice, we are obliged to make the valuable association of images which are found in spelling and the arithmetical tables occur often enough and vividly enough to become established. Other than spelling and the number tables, instances of such associations are likely to be word associations, which do not, however, constitute language. The most familiar instance is perhaps learning the names of the capitals of states. "Massachusetts," "New York," "Ohio," "North Carolina," seen or heard or uttered or written frequently enough and vividly enough in association with "Boston," "Albany," "Columbus," "Raleigh," will establish the word bonds which give us the names of the states and their capital cities.

So it is with habit in general. Nevertheless, we must not suppose that perceptual and imaginal associations are the whole of habit. Many of our habits are sheer neuro-muscular patterns, and when some of these are practiced enough, they become refined into particular learning products, such as walking and its derivatives, and sundry special abilities.

Not to be confounded with understanding. Details arising

in situations which are apparently similar to the foregoing are not primarily instances of either recall or of established association. Such appear typically in the sciences in the presence of learning products which are insights or understandings and the underlying adaptive processes are concept and language, or, collectively, ratiocination.

For example, the location of valves in a pump. Now, in instructional practice, an attempt may be made to solve the problem by requiring that the valves be memorized, usually in preparation for examination or under some equivalent cramming stimulus. Of course it cannot be done, for pumps are not all alike. On the other hand, the pupil, by process of permitting concepts to form in consciousness, especially those which arise from the contemplation of cause and effect, arrives at an understanding of pumps—he sees “how they work.” The outcome is a learning product, a contribution to intelligence. Confronted with a pump situation and asked to describe the action of the valves, he does so, not as a matter of recall, but rather as a matter of prediction. In brief, he “sees what they must be,” to use a piece of actual introspective testimony. Now, if he goes on and acquires an elaborated piece of organized thinking in the form of the principles of hydraulics and pneumatics, the time comes when he can think out valve arrangements in any kind of pump, whether the latter be a mechanical appliance or the animal heart. Thus the psychology of the varying situation.

The spelling of a word, the facts exhibited in a table, the names of the state capitals do not represent variable situation, or situation which is capable of being understood by pupils. C-h-i-c-a-g-o always spells “Chicago.” It does not spell “Chicago,” or “Calcutta,” or “Cairo,”

depending on circumstances. If the spellings or the facts or the names are to be used in adaptive behavior, they must become products in personality in the form of established associations.

Orientation. Parallel with recall as a memory process is *orientation*, in identity, time, and space. Normally we are aware of the identity of ourselves and of our placing in time and space. When consciousness begins to break down and the integrity of the memory system is impaired, the patient often loses sense of his own identity, of the time in which he is living, and of the place in which he is. Curiously enough, such failure does not necessarily involve destruction or even impairment of personality. For example, patients in hospitals who are so badly disoriented that they are manifestly unaware of the place in which they are will sometimes yield to the directions and ministrations of physicians and nurses quite as mentally normal persons do, whereas they will not yield to similar directions and ministrations at the hands of others.

Abnormalities. Recall sometimes plays weird pranks in abnormal mental states, but it is no part of our present need to explore the field of abnormal psychology. Suffice it to say that in maladies of the adaptive system, one of the first things the diagnostician looks for is disorder of recall and orientation.

Imagination

We should not get along very well if we had to depend exclusively on actual perceptual experience or even memory. We know that we can form pictures, not only of what has happened in the past, but of what will happen in the future. We see ourselves doing certain things and certain consequences accruing. Thus, we distinguish be-

tween memory images and those which arise out of constructive imagination.

Conceptual process

We have tales, which are apparently veracious, of horses stopping at traffic lights of their own motion. Be that as it may, anybody whose memory goes back to the days of horse and buggy has recollections of horses carrying out lines of behavior founded on previous experience. It used to be embarrassing for a young man to attempt to set up in a girl the illusion that he was driving her out behind a stylish horse, only to have the animal exhibit indubitable evidence that his customary office was that of drawing a milk-wagon.

So the horse may be said to rise to the level of perception. *He encounters a good many red objects in the course of his daily round and each of them is capable of generating in consciousness the sensation of redness, but he does not stop when he sees a red house or a red automobile or a red raincoat; he does stop at a red light, and a particular kind of red light at that.*

The human, however, not only becomes aware of red light, but of red traffic signal, part of a scheme of affairs designed to guide and control the users of streets. He entertains a generalized idea or concept and is thus capable of discriminating or forming judgments. His mental responses are distinctly human and their humanness at bottom consists in the process which we call "conception," so much so that his behavior is very largely conceptual behavior. Thinking may go on at the imaginal level of trial-and-error, but most of what we dignify as thinking is conceptual thinking — that is to say, a chain of concepts running through consciousness until the

combination occurs which gives satisfaction as being congruent with that system of memory which is the basis of the particular self which is doing the thinking; that is to say, the combination which discharges affect.

Judgment and reasoning. Whenever equilibrium is thus reached, we say that an act of judgment takes place. Coming down from the days of faculty psychology, when much was made of judgment as the supreme human endowment, the term has lingered as the name of a distinct mental process. Judgment is only the name of what takes place when a conceptual process culminates. There are half a dozen red lights. I wonder what they are. Now, that and that are red lanterns left by workmen who have been digging that ditch. That one is a signal for street-car men; that is a switch light, and that must be a light in the store window just beyond. Ah, I see, there is a crossing there and so the remaining light must be the traffic light. Judgment and peace.

Similarly with reasoning, the name given to particular kinds of conceptual chains, where concepts have been brought under control of higher-level concepts — that is, a hierarchy. Reasoning thus implies a *system of concepts* or organized science of some sort. The system has to be learned as system. Hence, reason is more truly a term in personality than an adaptive process.

Symbolism. Closely related to the conceptual process, possibly a part of it, is the symbolism which is found particularly in language, graphic representation, and mathematics.

If life went on entirely at the stage suggested by the illustration of the traffic-light problem, civilization, or the art of living together in society and in the world, would not get very far. Concepts and whole chains of judg-

ments get salted down as it were and usable as words and sentences, thus enormously short-circuiting the process which must deal with general ideas in the original or naïve form. Thus, we can elucidate a prolonged course of thinking to ourselves or to other people, only occasionally having recourse to the concepts themselves. Nevertheless, it is but loose thinking which fails to keep discourse in contact with conceptual reality. It is very easy to allow language to get so far away from reality that the individual gets wrapped up in his symbolism as such. That way lies mysticism. The critic brings us back to earth with the query, "Just what do you mean?" High-school and college teachers who take their paper work seriously have frequent occasion to check students who utter whole passages which literally have no meaning at all.

Now language is an elaborated form of speech. Language has to be learned as a system, primarily as a medium of social intercourse; secondarily, and by implication, as a means of thinking. Thus, speech is an adaptive mental process; language is a social institution and as such an instrument of symbolism. Language learned is a product in personality.

Next after language is graphic representation — that is to say, the representation of things, persons, and concepts by combinations of lines, or lines and color. Thus, concepts are made manageable both in communication and in individual thinking. Symbolism is the adaptive process; graphic representation is the social institution which serves as an instrument of symbolism.

The supreme illustration is found in mathematics and notably in the application of mathematics to science, supreme because here symbolism makes it possible to form judgments based on concepts which transcend

direct experience. Mathematics is a product of social learning and it is not usable in the symbolic process save as the individual learns it.

Thus, the essential organic adaptive processes which it is convenient to designate as mental. How about *mind*? Is mind something dynamic, something in the nature of an organ?

Mind

We should find it difficult, even if it were desirable, to dislodge such a concept from the thinking processes of the non-critical layman. Nevertheless, "mind" as the term is commonly used is a left-over from the faculty psychology and the notion that there are mental organs analogous to bodily organs. Understanding of the adaptive organism which the progress of science has made possible leaves no room for such psychic organs. Psychic organic processes, including mental processes, are manifest and understandable. The only place left for "mind" as a scientific term is that which is typified by the use which Robinson employs in *Mind in the Making*, where the meaning is nearly equivalent to "personality." In non-scientific literature, that is the meaning most commonly found. Otherwise "mind" signifies only mental processes.

In education. Mind has been looked upon as the very citadel of education, and yet education has no more concern with mind or mental processes than it has with other adaptive processes both psychical and physical. Neither mind nor brain is educated, nor are any of the adaptive processes. The adaptive organism as a whole makes education possible, but the organism is not educated any more than a telescope or balance or book or other mech-

anism which makes education possible is educated. Attention is not educated, but developing personality makes attention possible in situations in which it otherwise would not occur. Perception is not educated, but accumulating experience determines the character of percepts. Memory and recall are not educated, but, as personality develops, the memory system expands in content and becomes organized so that efficient recall becomes more and more possible. Imagination is not educated, but imagination, like the other mental processes, not only makes education possible, but as personality develops the scope of imagination is broadened. The conceptual process in its several phases is not educated, but more and more concepts accrue, and that is perhaps the heart of the process of becoming the kind of person who knows what to do. Organic thinking capacity is never educated, but the individual can learn to think logically. Speech and symbolic capacity in general are not educated, but language, graphic representation, mathematics, are learned, and being learned they marvelously extend the application of symbolic capacity.

VII

CONSCIOUSNESS

We have been liberal in our use of the word "consciousness." What is consciousness? There have been innumerable attempts to define it, both in metaphysics and in that psychology which is still rooted in metaphysics. Such attempts are as futile as similar attempts to define life and energy. Nobody doubts life, but the students who deal with life, the biologists, disclaim any definition of life save that which is implied in the conditions and manifestations of life. So physicists carry our concep-

tions of the physical world to marvelous lengths on the shoulders of the notion of energy, but none of them has ever been able to define energy. So it is with consciousness. In philosophical terms it is not a process, but a mode of existence, and that is as far as we can go. Nevertheless, we can make progress by studying the manifestations of consciousness.

Physical conditions

Now biologists in their various departments have made much out of vital processes. Their disclosures make it manifest that the rate and intensity at which vital processes go on vary a great deal as between different forms of life, as between individuals of the same species, as between two periods of time in the existence of the same individual. The term which is most useful in their thinking is "metabolism," which signifies the conversion of energy derived from the chemical elements of food and from the oxygen of the air into forms which living processes require. An extremely pregnant generalization is that brought out by Child, to which I have several times referred, namely, that of metabolic gradient or a condition within the body under which metabolism can go on at higher and higher rates as we approach the region of head dominance, in creatures which are structurally so arranged that head dominance is possible. To be sure, physiological gradients exist quite without reference to head dominance as such, but it is the latter form in which we are interested.

On the whole, evidence from several sources converges on the inference that consciousness appears in the world when the head-dominance situation is established, and further that intensity of consciousness, or attention, is

more or less in proportion to the metabolic differential which can be established. *Why* it should be so, we do not know, any more than we know *why* life or energy or the factors of organic evolution should have appeared as modes of existence. God so ordained it is as good an explanation as any, certainly to most people the most satisfying explanation.

First of all, as we have seen, positive clinical and laboratory evidence of loss of consciousness appears when blood supply is shut off from the cerebral hemispheres. The brain may be distressingly and extensively damaged, but so long as enough of it is left to maintain physiological dominance, consciousness abides. Any other part of the body may be injured, even to the point of death, but so long as the brain can still function as a vital organ, consciousness lingers.

Second, it is matter of common experience that shock arising from a blow on the head will for the time being abolish consciousness, and furthermore that anything which drafts away blood supply from the brain, such, for instance, as occurs during digestion, will diminish the intensity of consciousness.

In the third place, we know that glandular imbalance sometimes interferes with the metabolic rate itself. We know that pupils are sometimes so affected that these characteristically tend to fall off in learning capacity and that appropriate medical treatment restores both metabolic rate and learning capacity. We further know that some forms of ill health have a tendency to dull consciousness, although we must bear in mind that in some such cases impairment of adaptive capacity is not a matter of dulling consciousness, but rather the preoccupation of the focus of attention by pain affect.

Fourthly, in decerebrate dogs and other higher mammals — that is to say, animals in which the brain has been cut off without impairing the lower centers which control the vital processes of respiration and circulation — there is no outward appearance of behavior which we reasonably associate with conscious activity. To be sure, we cannot question the dog or the monkey and ask him how he feels about it.

Finally, as we ascend the scale of animal life, clear evidence of consciousness is very closely in proportion, first, to the establishment of head dominance, and, second, to the enlargement of brain in proportion to bodily weight — that is to say, to the increase of bulk in the head of tissue which has the high metabolic rate of nerve tissue. It is apparently true, then, that in general creatures which possess proportionately the largest brains tend to be those in which consciousness can be most acute. We ought, however, to bear in mind that the bulk of Man's brain, more than twice that of the highest apes, probably gives him no proportionate advantage arising from metabolic gradient. When things get to be good enough, they are not likely to become much better. Man's superiority over the other primates, as we have seen, is in his discriminating senses, hand, vocal organs, and erect posture. His larger and better organized brain is an implication of his organs of locomotion, grasping, and speech; but this statement must not be taken to mean that he gets a better brain by *using* his hands and voice.

Attention. As we have seen, attention is a state of consciousness which arises under affective process. The nature of affective process is in the principle that metabolic rate is increased and hence the metabolic gradient is accentuated. As we have further seen, individuals differ

a good deal in their affective susceptibility — that is to say, in the likelihood that experience will generate affect. Hence, *other things being equal*, acute attention more readily arises in individuals who are highly susceptible. They pay the penalty in greater liability to excess affect and to emotional preoccupation of the focus of attention.

Subconscious and unconscious. A great deal of confusion has arisen from the use of such terms as "subconscious mind," "psychology of the unconscious," and so on. The confusion arises not so much from the phenomena observed as from the garbled terminology thus set up.

To speak of the subconscious mind is merely to talk nonsense. Mental processes and indeed all psychical processes yield phenomena in consciousness or else they are not psychical at all. Reflex action does not ordinarily yield phenomena in consciousness, but then reflex is not a psychical process. To call it subconscious is as meaningless as it would be to call the circulation of the blood subconscious. To be sure, we can observe in ourselves reflexes such as those of the eyelids and the knee jerk. In that sense they enter consciousness, but in no other sense than observance of the action of the pulse or that of an electric bell is in consciousness. Reflex is not a conscious *process* nor is the heartbeat or the ringing of the bell.

Impulsive and habitual behavior, on the other hand, are conscious processes, but not in the focus of attention. One dodges out of danger in crossing the street and is very likely unable to testify whether he did so or not, but that does not mean that his act did not enter consciousness. He beheld or heard or otherwise sensed the menace

and acted accordingly, but he was not attentive and perhaps the act did not register in the memory stream. In habitual behavior, however, we must distinguish between what is properly habit and what is neuro-muscular learning product. Thus, walking is a neuro-muscular learning and not classifiable as habit. Following an accustomed pathway in the daily round is habit. Walking is not a conscious process; following a given route to the school building is a conscious process.

Confusion sometimes arises over failure to grasp the significance of personal behavior in its relation to consciousness. Why does one follow out a course of action which is objectively intelligent or another which is objectively ethical, in either case exhibiting behavior which is objectively right? If asked, the individual is likely to answer, "Why, I don't know; I just did it." Sometimes he will say, "I did it instinctively," or perhaps "unconsciously." Of course, the action is the reverse of instinctive, and as adaptive response it very likely requires but momentary attention, since all that class of problems has been generalized as an adaptive change in personality. Nevertheless, the behavior is a conscious process and in no proper sense automatic. The witness who says that he acted unconsciously in reality means that he did not introspect and analyze.

In very little of our normal life are we in an unconscious state, albeit there is much in our current environment from day to day which does not enter consciousness. We are *unaware*, for instance, of what is silently going on behind our backs and of what is happening in distant regions. We may read or hear of what went on somewhere else, and in that case our conscious processes are centered on the content of the newspaper or on our informant.

Imaginal process gives us vicarious rather than direct experience. Even in sleep or hypnosis or under anaesthesia, there is still a form of consciousness to which Morton Prince attached the name "co-consciousness." Such states and others like them sometimes result in weird behavior which the psychopathologists describe for us. In the rare instances in which consciousness is actually and unmistakably abolished, there seems to be a veritable gap in the memory system and the patient resumes conscious activity at the point at which the interruption came, even to the extent, it is said, of finishing an uncompleted sentence.

We have thus completed our study of the adaptive organism in its two aspects so far as function and process are concerned. It is essential that we should understand, at least in this elementary way, the organism through which education proceeds. It is still more important for us to see clearly the distinction between the organism and the outcome of organic activity. Perhaps most of all is it important to have identified and excluded erroneous theories of education which are founded on failure to recognize the distinctions which we have noted.

We ought now to turn from our prolonged consideration of origins and processes to a study of product as it appears in Personality.

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CHAPTER VII

PERSONALITY

IN OUR study up to this point, we have in the first place seen the fundamental law of life wherever life exists to be adjustment to the circumstances of getting on in the world; and in the second place have seen that any species whether of plants or animals is defined by what it has come to be under this process of adjustment. So it is with that zoölogical species to which we belong.

We have further seen that, as we ascend the tree which pictures the evolution of the animals, there is steady improvement in the instrument by which individuals of different species can adjust themselves during their own lifetimes, until in humans the instrument becomes so efficient that a qualitative change in the order of things becomes inevitable. Human society, culture, personality appear in the universe, not by the fiat of a creator, but because Man's adaptive organism made them inevitable; but inevitable in no different sense from that in which existence on grassy plains with inferior organs of defense made the horse inevitable and defined him. Nature did not thereby repeal her laws nor did evolution come to an end. Rather evolution took a new direction and began to deal with different subject matter. The method of variation, heredity, and survival still held sway, but variation came to be in ideas and ideals; heredity, more and more transmission of evolutionary products by individual learning; and survival, the survival of folkways and mores which worked under the requirement of adjustment. Just

as in the long process of organic evolution, untold millions of physical variations vanished because they did not in fact contribute to adjustment, so in the history of culture myriads of new ideas have perished and have been forgotten because they would not in fact contribute to social and personal adjustment.

So it is with the human individual. At any point in his career he is defined by what he has come to be, not merely physically, but in a much wider sense personally. He may have come into perfect adjustment. In that case we say that he is fully civilized and perfectly sane. Nobody is that, but a great many are civilized and come within the limits of tolerance. Others are semi-civilized or primitive and yet sane. Others are insane.

I

CONTRAST WITH ADAPTIVE ORGANISM

In our prolonged study of the adaptive organism, we have been particularly diligent in distinguishing between the organism itself in its functioning and what is the outcome of its functioning, between adaptive responses and adaptive changes. We have seen that the organism is the instrument through which adjustment is brought about and appropriate responses made, whether the latter be at or below the level of personality. Self is the entity in which adjustment inheres and personality the form which adjustment takes.

Even though the infant could grow up in isolation from his kind and all culture, he would still be a self, and, so far as we know, his adaptive organism would be the same and would function the same as it would if he grew up in a highly civilized family and society. But he would have only the kind of adjustments which the other primates

possess. He would learn to walk and run and probably use stones and branches of trees as implements; but he would never learn language, nor learn to reason, nor would he ever construct and use tools in the proper sense. He would be self and organism, but never person. He might be clever, but never come to possess intelligence. Personality would always remain possible and never arise, at least in him as an individual.

Development of personality

Now every infant born into the world starts life at exactly the same point as our imaginary feral child. He is self and organism, but, save in the eyes of the law, no person. Even the law for twenty-one years to come will not admit that he is more than a qualified person; he is a minor. He begins, however, to become a person by taking on the learnings which his race has acquired, capitalized, and handed down through the course of centuries untold. Appetite impels him to seek his own way. He is prevented, and under good upbringing ceases even to desire his own way, save under conditions which are sanctioned, not by society, but by the circumstances under which life in society goes on. Later he becomes the kind of person who reads, writes, and ciphers. Later still, the kind of person whose outlook on the world is characterized by what we call intelligence and ideals. Finally, if upbringing and instruction are of the best, he conceivably becomes the kind of person who is all that the most highly adjusted and integrated of his race has ever yet become. At the least, he becomes civilized, and at the best, highly civilized.

On the other hand, if he is born into a family and community which are only semi-civilized and remains there

without contact with the instruments of culture and civilization, he will himself become but semi-civilized.

Finally, if he is born into one of the primitive races and remains under that influence, he himself will become but a primitive — a person still, but a primitive person. There are, however, but few of the primitive races left which are isolated from all contact with civilization. The consequence is that a good many of the youth of such races learn the adaptive responses which are appropriate to civilization and thus become spurious. Removed from contact with the civilized world, they promptly revert to the primitive personality which is genuine. Such are the stock-in-trade of those who argue the ineducability of the backward races. Not so. Eschewing all sociological empiricism founded on travelers' tales and recurring to our study of the genus *homo sapiens* and its adaptive organism, it is difficult *a priori* to believe that normal individuals of backward races are organically ineducable. We shall return to the issue on factual grounds in a later chapter.¹ True enough, organization of adequate schools and school systems and the formulation of an appropriate instructional procedure may be beyond our present resources, but one cannot infer impossibility from that which is difficult.

Now perhaps the greatest problem of instructional statesmanship arises from the fact that there are always semi-civilized and primitive families within civilized society and from the further fact that the youth of the race always shows a tendency, apart from constraint, to become arrested at the level of the least civilized adult individuals in the community. Thus, the phenomena of personal degeneracy. The civilized portion of the com-

¹ See Chapter XI.

munity is prone to be deluded by the inferiority compensations of the degenerates.

In brief, *personality at any given level of individual development is the resultant of the sum total of learnings to date.* Each learning which the individual takes on, from obedience to concept of causality, is an accretion to personality. Each is a personal adaptation, in so far as it contributes to adjustment, a maladaptation in so far as it contributes to maladjustment. Nor is any particular accretion to be understood as a behavior pattern. On the contrary, it is a determiner of what behavior patterns will arise.

Maturity. The time comes when the individual is in actuality capable of governing his own further education. He knows what is good for him. In legal terms he has reached his majority and is presumed to be responsible — that is, to be effectively aware of the consequences of his own acts. Whether or not he is actually responsible is another matter. In educational terms, he is "mature."

All along, his organism develops under its own laws. Perception is perception, appetite is appetite, musculature is musculature. By the time personality is at its best, organic processes have long since begun to fail. In truth, the organism in both its physical and psychical aspects becomes part of the environment, much as do the scientist's instruments, the craftsman's tools, the merchant's account books. Personal development may operate to conserve the organism and keep it at its best. Personal maladaptations may lead to abuse of body and psyche and they may involve organic malfunction.

The notion of mental age. Clever designing of material during the past thirty years, and use of the same in testing many thousands of individuals, has led to the concept of

mental age and to exceedingly fundamental inferences drawn therefrom.

If you can devise questions of the kind concerning which there is a fair presumption that children and older people will answer them correctly, if the individuals are organically normal and have had normal opportunities to learn, then children taken in large numbers will show strikingly harmonious results at corresponding age-levels. More than that, apart from unusually advantageous experiences and systematic instruction, the relationship between an individual's test achievements and his chronological age will remain nearly constant, so much so that the index, thus derived, known as I.Q., or intelligence quotient, is thought to characterize him positively as an individual. By testing a great many individuals and treating the results statistically, age norms are derived. That is to say, a given chronological age shows a result which is statistically characteristic of that age. A given individual who achieves a test result characteristic of a given age is said to have that mental age, no matter what his chronological age may be. There is some truth in the matter as well as a great deal of fallacy. The important issue is, What is true?

The particular fallacy which concerns us in our present study hangs about the term "mental age."

The assumption on which the whole procedure rests is contained in the belief that mind is an organ, that mind develops by a natural growth process, and that by and large individuals learn from the common experiences of life in proportion to the growth of mind.

Now, as we have abundantly seen, mind is not an organ, but only the name applied to a particular group of organic adaptive processes.

We know that physical growth does go on from year to year and that from time to time some of the physiological processes come into functional activity. Thus, height, weight, progress of ossification and dentition, myelinization of nerve fibers and the like, can be measured and the indices thus derived compared with chronological age. These are anatomical terms. It does not follow that physiological processes show a corresponding kind and range of growth, so that vision, hearing, digestion, respiration, circulation, and so on improve steadily up to maturity.

Still less does it follow that mental processes, such as sensation, perception, imagination, judgment, follow a growth curve like and corresponding to anatomical development. On the contrary, we know that the laws of development both in the race and in the individual are quite different. In general, quantitative organic growth from time to time reaches stages at which qualitative changes appear.

Vision is plainly inferior in the newborn infant, but, as the physical organs develop, the period soon comes at which vision as such is as good as it ever will be. So it is with hearing. Imagination is prolific in childhood until personal development brings increasing sense of reality. Memory, as distinguished from content in memory, is so alert that during the involution of senescence it is childish and youthful content in memory that survives and becomes prominent. Consciousness is acute. Judgment as such is as reliable as in adult life, but the logical controls of judgment must be learned, and it is only too evident that they are lame and halting even in most adults through educational defects. Just as Cro-Magnon Man was probably organically capable of all that modern Man

learns; so the child of nine or ten is in all probability mentally as good as he ever will be. Man of the Stone Age lived in a very meager culture; the child of the race today has much to learn.

Mental age is therefore a misnomer and a singularly unfortunate conception. What the intelligence tests reveal is one aspect of *personal age*.

On our principles, the tests are rightly named, for increasing intelligence is one side of increasing personality. They are crude, for there is nothing in any intelligence test in common use in school administration, known to the writer, which would not as readily be responded to on the basis of spurious as on that of genuine personality. In teaching terms, they can be crammed. They are inadequate, for none of them reaches the volitional, moral, and æsthetic components of personality. Rightly and critically used, they are valuable instructional instruments. Wrongly used by half-trained psychologists and untrained teachers, they constitute a ready excuse for incompetent teaching or no teaching at all. Applied as measures of organic capacity, their administrators perpetrate a miserable piece of fundamental injustice.

II

USE OF THE TERM PERSONALITY

The word "person" is a very fundamental element in our vocabulary. Originally a theatrical term, it was taken over by the Roman law and by that route found its way into English law, where it has a scientific meaning. In the vernacular, the cognate "personality" is one of the words which has almost lost its meaning under the tendency of careless folk to employ words which have no definite significance to them, but which they rather like.

Thus, "personality" has come to have a range of meanings running from approximately the correct use to just "It." "Personality" is used where what is meant is "temperament," "individuality," "charm," "character" — and "It." The climax of absurdity is reached when people talk about the personality of a landscape. As the word begins to appear in scientific writings, it seems to irritate essay writers only less than does the word "integration." Well, when people began to see "kilowatt-hours" on their electric-light bills, a good many thought they were being cheated; the same kind of people nowadays feel complimented.

The Century Dictionary has the following definitions:

Person: A human being; a man, woman or child; an individual; in a broader sense, a self-conscious being.

Personality: The essential character of a person as distinguished from a thing; self-consciousness; existence as a self-conscious being; also personal qualities or endowments considered collectively; a person.

Sufficiently vague, perhaps, but still an authentic definition from usage.

Now "temperament" as we have seen is an organic term. Individuals may be good-natured or the reverse, high-strung or phlegmatic, moody or stable, gloomy or optimistic, depending upon physiological characteristics. Furthermore, physiological investigation has yielded abundant evidence which enables us to account for such traits on purely physical grounds. No doubt, personality which goes wrong may induce the phenomena of unfavorable temperamental traits and indeed generate the underlying physiological conditions. On the other hand, well-developed and integrated personality may go far to prevent unfavorable temperamental traits from disclosing

themselves. Failure in development of personality may prevent revelation of favorable traits and deprive the individual of the advantages thereof. So it is perhaps with talents so-called. Nevertheless, in the end temperament is one thing and personality another.

Individuality is the set of qualities which mark off one individual from another. A highly developed person, as we shall see, is of necessity highly individuated, but individuality is not personality. A dog is often distinctly individual — that is to say, he is different from other dogs. But no dog is ever a person, nor does he possess personality.

Personality is perhaps most often confounded with "charm" or the qualities which appeal to and influence others. Thus, we say that a man has a compelling or attractive personality when what we mean is that he has qualities which attract one's attention, delight one, command admiration. An individual may possess charm as the result of what temperament has led him to become, but charm is not personality. Rather it is a characteristic of some personalities.

"Character" might be accepted as a better word than personality for the entity which we have in mind, were it not for the fact that "character" is commonly appropriated as the name for moral and volitional attributes. Thus, character is certainly a part of personality, but personality goes beyond character.

Mind and personality. One could wish that the use of the term "mind," as it is employed in *Mind in the Making*, and frequently in good general literary use, could have come into general critical use and into scientific use. If it could have, not only would any such term as "personality" be unnecessary, but psychology would have been

saved from a great deal of terminological confusion. For example, such a term as "mental age" might at once have become not only comprehensible but justifiable.

The notable difficulty, however, resides in the principle that this is not the use of "mind" which science employs.

In *A Student's Dictionary of Psychological Terms*, English has the following:

- (1) System or organization of all *mental phenomena*.
- (2) = *Self, Soul, or Psyche*. This use, though current, is often very misleading.
- (3) In the popular or literary contrast of mind and heart, = intellect.

Thus, the justifiable critical use of "mind" places it as a term in the adaptive organism, and in only a derived and uncritical use does it stand for the product of adaptive functioning.

Scientific use

So long as science was preoccupied with organism, and all behavior was thought to be organic and nothing else, "personality" was a term in jurisprudence and religion, but not elsewhere. As soon, however, as psychiatric practice had gone far enough to yield phenomena which could be accounted for only on the hypothesis that they were the outcome of experience, and remedial treatment had confirmed the hypothesis, "personality" began to find its way into scientific use. We begin to find such terms as "personal deviation" and "personal abnormality." To be sure, the term "psychic" has not yet become entirely differentiated from "personal," so that we find that "psychogenic" is the term employed for maladies which are personal in origin. Similarly, the old category of mental and nervous diseases is still used to cover forms of malady which are neither mental nor nervous, nor yet

disease entities at all. Nevertheless, the term "personality," as we must employ it in education, has much the same meaning as that which it has in modern psychopathology.

If the reader were to undertake the task of collecting all the uses of the term which he can find in scientific or semi-scientific books, I feel confident that he would conclude that the meaning and significance of the word as thus employed would fall into one or another of the following categories, although he would certainly discover that very many writers indeed use the term in two or more quite different meanings.

(1) Medical and medical-psychiatrist writers tend to use it as synonymous with temperament or physiological pattern or adaptive capacity, which is evidently a garbled use of the root meaning and the meaning which is sanctioned by good literary use. One might just as well take the individual's characteristic pulse, respiration, digestive peculiarities, muscular condition, susceptibility to disease, and call it personality.

(2) Sometimes it appears as equivalent to "soul," "pneuma," "ka," "psyche," none of them equivalent to the Christian conception of soul, and, even if it were, hardly suitable for use as a scientific term.

(3) More and more it appears in the sense in which the word is used in this chapter and this volume, certainly not a garbled use and one which is consistent with all we know about Man's place in Nature and about the nature and extent of his original endowment.

Now basal adaptive capacity may differ markedly between two individuals, but the respective outcomes in personality may and commonly do differ a great deal more. In fact, the comparative adjustment of the two

may be reversed in relation to adaptive capacity. The dullard may have learned more and the brighter one of the pair less.

Temperament can be modified by medical treatment, and, in so far as it is thus unmodified, its outward manifestations in personal accretions are commonly modified a great deal by right upbringing and instruction.

Desire is no doubt based on appetite and appetite is organic. Nevertheless, not only are desires sublimated under education and thus reversed in direction, but entirely new desires appear.

Even phobias have origins in experience. They are learning products and part of the fabric of the personality in which they occur. When they are removed, the process of removal is essentially instructional in character.

In brief, "personality" as the term for original nature breaks down because the recent progress of scientific investigation has completely modified our conceptions of original nature. If humans came into the world equipped with unlearned adjustments as do some of the lower orders, and if individuals differed greatly in their equipment of instincts, then the meaning of "personality," as the term is apparently used in many scientific writings, would have some justification. But we not only know that there is little or no evidence that humans possess anything equivalent to nest-building and migration in birds, but we know that there is positive evidence to the contrary.

Personal behavior

And so the contrast is finally drawn between organic and personal behavior.

Reflex, physical tropism, impulse, conditioned response, are all forms of organic behavior. They may or may not

be modified by personal accretions. They are not dependent on what has been learned, on intelligence or reason, or ideals or volitions.

Personal behavior, on the other hand, is determined by what the individual has learned and has become as a person. It cannot exist apart from culture or the accumulated social learnings of the race, nor can it exist apart from an organism which makes such learnings possible.

CHAPTER VIII

THE FABRIC OF PERSONALITY

IN THE preceding chapters we have drawn in contrast the adaptive organism and the products thereof in the learned adjustments which are essentially human, for which the most suitable term is "personal," and which taken together constitute "personality." Now personality is but a vague term unless we can get some notion of it in the concrete. It is mystical unless we can relate it convincingly to notions with which we are familiar. It is hopeless even to try to do either unless we can divest ourselves of the shallow materialistic views of life which are so characteristic of modern times, unless we can hold the middle path between mysticism on the one hand and materialism on the other.

I

NATURE OF LEARNINGS RECALLED

In the first place, then, it is well to remind ourselves of the nature of the learnings which contribute to education — that is, to adjustment and integration. Such learnings are always in the nature of new points of view or else acquired capacities for getting experience and reacting adaptively to external circumstance. They may involve knowledge and sundry arts, but it is what comes out of knowledge and the arts that counts.

They are not primarily content in memory, albeit the circumstances under which they are acquired are as truly a part of the memory system as are any other experiences. They are in memory because they have figured in ex-

perience; they are not learnings merely because they are a part of memory. Hence, learnings are not information, but rather in part what may have arisen out of information.

They are not acquired adaptive responses, but every true learning makes possible innumerable adaptive responses, as experience of life varies. A very clever dog, who is a friend of the author, seems to have learned the responses which are appropriate to a large number of spoken sentences, but that does not mean that the dog is learning a language and becoming a person. He can react only to the specific sentences which he recognizes; he cannot use them to meet all sorts of situations in dealing with his human friends. Nevertheless, as we have seen, the lives of a great many people seem to differ in degree rather than in kind from that of the dog.

They are not habits, although habits may arise out of personal learnings and be controlled by the latter. Nor are they conditioned responses, which are organic and the very opposite of personal learnings.

Nor finally are they to be confused with unlearned organic behavior, which goes on in Man as it does in all animals and even in plants.

Indefeasibility

Now, given a normal child living in society, personality in him is as inevitable as is physical growth. He will learn, just because he has the organism which is appropriate to learning. He cannot help it. Some sort of education will arise, provided he finds experience in the world; just as physical growth will take place, provided he finds food and drink. Nature protects his physical development, within broad limits. Nature furnishes no

guaranties whatever that education will be right. Her purpose is achieved when a dominant animal is produced, capable of surviving in contact with his kind and reproducing his kind. Right¹ education depends on the governance exercised by the institutions of social control, the Family, the School, and the State, whether the latter be in civil form, or military, or ecclesiastical.

It follows that the individual, constantly having experience and reacting to experience, will take on a great multitude of learnings which are peculiar to him as an individual. Some of them will be adaptive and in the interest of the survival of his self. Some of them may be maladaptive, *tending* toward elimination in the form of insanity. Many of them will be perverse; that is to say, tending not necessarily toward the individual's elimination, but toward the impairment of civilized order in society.

Fabric

Now, as personal development goes on, we can readily see it following the laws of all organismic evolution. It develops structural as well as specific or individual elements. We note that some of the learnings stand out, and more and more tend to determine what minor learnings shall be, partly because these structural elements make a host of minor learnings possible and partly because the former determine what the latter shall be.

The undisciplined individual, for instance, comparatively early in life, comes to entertain the conviction that "looking out for Number One" is the beginning of wisdom.

¹ We recall here that by "right" we mean normal, valid, straight, effective — right in the sense of the Greek prefix "ortho" as the latter is found in words like "orthogenic" and "orthopedic." There is no moral and still less any political connotation.

Thereafter, not only is all experience excluded which would tend to the contrary, but all the experience which he does entertain comes to form a cluster of minor learnings about the major learning. The latter has become structural. He is an egoist, not by default of learning — infantilism — but by perverse learning.

Again, he finds satisfaction in vigorous and forthputting activity and an accession of strength to personality is the outcome. An attitude toward life is formed which is structural. New experiences are made possible out of which an indefinite number of minor learnings arise; and minor learnings which otherwise might accrue tend to be excluded.

Once more, in the stress of his plastic years, he encounters defeat and accepts it, or a dread is built up, or a fundamental error in insight is established. A structural maladaptation is formed which not only excludes experience out of which right learnings might emerge, but experience accrues out of which further maladaptations arise.

Thus, we are accustomed to say that the individual is molded by his experience of life. So he is — molded by the structural elements in personality which he takes on. Left to himself, the indefeasible nature of personal development is sufficient to produce an individual who is very much what organic characteristics determine — native vitality, temperament; in a word, organic capacity and tendency. Apart from abiding strength in the fundamental institutions of society which govern upbringing and instruction, society has always tended to revert toward the pattern which is perhaps seen at its clearest in the tenth century of our era. That is why feudalism in one form or another tends constantly to reappear. At its best, the rank and file render service for protection to

strong men who are also good men. At its worst, the gangster extorts tribute from weak citizens for protection from the violence of other gangsters. In the middle ground, people delude themselves with yearnings for a mediæval manor on a national scale.

Under the systematic activity of home and school, the major strategy of upbringing and instruction is to see to it that right structural elements form and that during the plastic years there is minimum opportunity for maladaptations and perverse learnings to become structural.

Thus, the considerable number of structural and the vast multitude of minor, individual learnings form what may perhaps happily be termed the "fabric of personality," in which structural learnings bear a certain resemblance to the warp and the minor learnings to the woof of a textile.

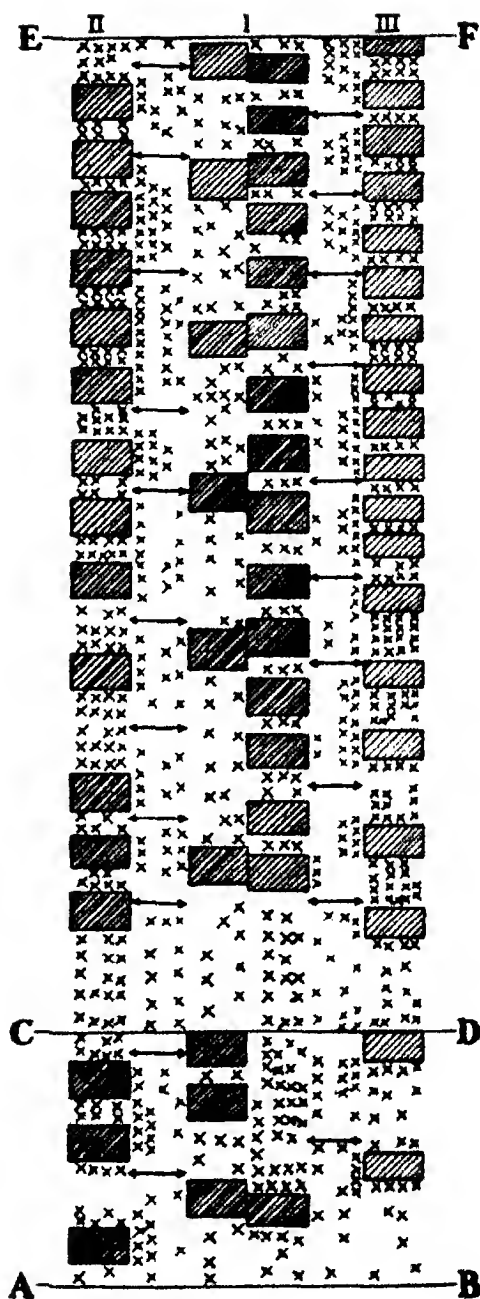
For the sake of concreteness, it may prove useful to have before us a scheme which will serve to illustrate. (See pages 244, 245.)

II

It may be well to trace out as well as we can, very much in outline, the structural elements of developing right personality, or at least the nature of the structural elements, in specific illustration.

STRUCTURAL LEARNINGS IN INFANCY

As soon as the baby's adaptive organism becomes functional, or, in common parlance, as soon as he "begins to take notice," he begins to learn; that is to say, personality begins to develop. Doubtless his earliest learnings are individual in character and random, largely, perhaps, the formation of percepts and memory content, out of which learnings as such evolve.



SCHEMA SUGGESTING FABRIC OF PERSONALITY

Explanation

The rectangles stand for structural and the crosses for individual learnings.

The double column at I is intended to represent the great integrating column of volitional and symbolic learnings — language, graphic representation, and mathematics — the backbone of personality.

Column II represents the learnings that we have called tastes and ideals, which are the products of appreciation, as indeed are the volitions.

Column III represents the intelligences which arise out of insights and which in their cultural form are largely the product of learning in the field of the sciences.

The horizontal arrows suggest the lines of integration by which the fabric is held together and personality becomes individual as distinguished from a mere aggregate.

AB is the birth line; CD the end of infancy and the beginning of schooling; EF the line of maturity.

Of course the diagram is only a scheme. It is not a design, nor is it accurately descriptive. It does not purport in the rectangles to represent all the structural learnings which are found in mature, adjusted, integrated personality, nor does it pretend that the crosses can be counted and in that way a measure set up.

Obedience

Very soon, however, the impulses of an organism which possesses no native adjustments reveal themselves and the baby begins to exploit his mother by getting his own way and attempting to make a lackey of her. When she resists and administers convincing evidence that piracy is no part of civilization, he mends his ways and takes the first step on the ladder. The process of sublimating appetite begins. To say that he "recognizes" that he must restrain his native impulses and obey lawful authority is to read into his system of ideas adult content. The baby obeys and comes to prefer life that way; that is all we can or need make out of the process.

When the baby says "Won't" or is contrary, that is an instance of negativism.¹ We need not fall back on the mystical explanation that he is "struggling to be free." He is infant and civilized personality is not yet founded. He has not learned obedience. Negativism in later childhood or adolescence is a bad sign.

A structural adaptation has formed, personality is founded, a step in the direction of adjustment to the circumstances of living in civilized society is made. That adaptation makes a good many others possible and it excludes perverse adaptations which otherwise might form. It is a type of all learnings of the *appreciation type*. Where such learning is expressed in outward behavior, *preference* appears.

Family affection

The normal parental pair are consumed with love for their child. So far as we can make out, that is a native

¹ See Martha M. Reynolds, *Negativism of Pre-School Children*, Teachers College Publications, 1928.

drive common to all the higher animals; in other words, it is inherent in the nature of the adaptive organism, a product of organic evolution. There is apparently no similar drive in the infant; he is equipped to learn affection as he is equipped to learn all the rest. If he fails to learn, he fails in one of the capital structural foundations upon which personality rests. The adaptation having been made, the baby is saved from experience out of which maladaptive and perverse learnings would be likely to arise, and he is put in the way of experience out of which right learnings will arise. In this way:

Lacking the normal love of infancy and early childhood, the affective organism fails to find its natural equilibrating center. The child cannot solve the stresses which he encounters, and to which personality is as yet inadequate, by taking refuge in his father and mother. Religion has apparently much the same function in the adult, and lack of it much the same consequence.

Externally, the pathway to adjustment in respect to the values in life rests at its best on this structural learning. The channel to most of the cultivated likes and dislikes of childhood and youth lies through the native tendency, common to most if not all mammals, to copy the affective patterns of elders. We like what those whom we admire like; most of all what admired and loved parents like.

There is little reason to think that a child's affection for his parents has in it any physiological factor. It arises, not because he is their offspring, but because in his urge toward survival he finds in his parents comfort and protection.

Walking

In due season, his neuro-muscular system is ripe for walking, but he has to learn to walk. He begins to prac-

tice the art and before long he has mastered it; he walks as does a person. Another structural adaptation has formed and the new learning puts the baby in possession of a means of access to experience out of which, under guidance and sometimes constraint, further accretions to personality arise. Walking is the type of all neuromuscular learnings.

Talking

A little later he acquires the supreme art of all; he learns through practice to talk. He has no beginner's book and no grammar, but as soon as he has something to say he learns to say it. Unhappily, he will not always be under the same kind of restraint. Talking is a personal adaptation, a step toward adjustment to the requirements of social existence. It is structural and it leads to a multitude of minor adaptations and ripens into thought. It is the type of all language learnings.

Self-dependence

If the baby has a sensible mother, he begins the rather extended process of learning how to care for his own bodily needs. We may enumerate here: (1) regularity in urination and defecation; (2) regularity in eating; (3) dressing and undressing and care of clothing; (4) management of the primary toilet requirements. So important are these learnings that various writers make a convincing case for the principle that caprice in eating, enuresis, and soiling, apart from known physical malady, are symptomatic of serious structural defect.¹ There are sundry bits of training required, but the real personal acquisition is in the form of *I can* plus *I prefer to do it my-*

¹ See, for instance, Blanche C. Weill, *The Behavior of Young Children of the Same Family*, 1928, Harvard University Press.

self. If his mother is self-indulgent, she will continue to care for him directly, or else employ a maid to do it for her, rather than go through the much harder task of upbringing. This major primary learning makes possible a great many other minor learnings. It is structural. The *I can* element is the type of all volitional learnings.

Thrift

Likely enough the child comes to prefer spreading over two days a satisfaction which he might use up in one. Sooner or later he must do so unless the burden of his existence in society is to be borne by other people. If that particular learning does take place, it lays the foundation of adjustment to the circumstances of society in its economic aspect. More than that, it lies behind prudence and foresight which are essential elements of intelligence.

Caution

Closely related to thrift is avoidance of danger, the establishment of *caution*. Herein is a terminological issue with which we ought to deal.

Popular writers who deal with animal life in fiction are fond of setting up such chapters as "When Fear Came." Lecturers on popular psychology warn parents' associations and mothers' meetings that they must avoid "implanting fear." Now here as elsewhere there is a fine confusion in terms.

The word "fear" in common use, like so many others which we have met, has no precise meaning. Sometimes it signifies reverence or respect, sometimes apprehension of evil, and sometimes it has a technical scientific signification. If we mean reverence or respect, let us say that.

If we mean caution, let us use the proper term. If we employ the word technically, let us use the technical term which is "phobia," the nearest equivalent of which in the vernacular is "dread."

Now a phobia is a maladaptive learning product which has become structural. We all have them more or less, and particularly people of sensitive temperament. A perfectly sane personality would be one in which, among other good qualities, there were no phobias, one in perfect personal health. Some of our phobias, most of them in the ordinary run of life, are minor matters, largely because the experience with which they are associated is uncommon and not ordinarily critical. Such, for instance, are dread of snakes and thunderstorms and high places. Some are mischievous in the extreme, such as dread of combat and outward enterprise in general. Some are abnormal, in the sense that they are unusual, such as dread of open spaces or closed spaces. Phobias must not be confounded with obsessions, such as always stepping on a particular stone or always picking up a pin. These are ordinarily instances of *conditioned behavior* proper, much as are most bad habits, ranging from the mild and comforting maladaptation of smoking to destructive addiction to drugs.¹

Now it is quite true that parents and teachers must avoid implanting phobias, but the phobias which they implant are their own. One can occasionally see the genesis of a phobia in a child as the outcome of an uncontrolled outbreak in a mother or nursemaid. Let us recall that copying the affective responses of elders is a fundamental adaptive process in mammals, including the human animal.

¹ See page 97.

Nevertheless, warning a child that he must "look both ways" when he crosses the street is a very different thing from flying into a "state of nerves" before him when a thunderstorm comes up. The child has to learn that there is such a thing as peril. When caution, in this precise sense of the term, becomes structural, the individual becomes the kind of person who "takes care." The world becomes apprehended as a place in which there are courses of conduct which are full of peril and others which are not. We sometimes see adults who, in most respects estimable people, are nevertheless infantile in this respect. They will not take care. As a result, they are always in trouble of some sort, altogether beyond the common fate, and they not infrequently bewail their lot as being somehow the product of injustice in the scheme of affairs.

Preference

In this pre-school period, the major learning products are arts, tastes, volitions, and the last two are manifested in preference. There are few if any major insights, and yet the judgment process must operate again and again in the control of behavior; judgment is an organic process while an insight is a personal accretion.

Now the parent will over and over again be obliged to employ forcible restraint and compulsion as instruments in upbringing. If the result is the attainment of a major art like walking or putting on one's clothes, that is the end of the matter. The art is the learning product, and it makes no difference, in principle, whether the learning is produced under compulsion or otherwise.

But if the upbringing calls for obedience and compulsion secures appropriate behavior, that is very far from learn-

ing. Obedience is the learning product and not behavior. If, for instance, a parent requires his child to keep away from a neighborhood which the former knows to be dangerous for children of that age, the child will doubtless conform, not from fear of influence of the neighborhood — that would be an adult response — but from fear of the consequences of non-conformity. If the parent goes away on a vacation, fear of consequences will become remote and the lure of the forbidden region will produce its normal behavior; the child will adventure. There is no element of obedience or disobedience in the situation, but only of conformity or non-conformity. Since the compelling agent is removed, non-conformity is the normal response. But if, on the other hand, the parent has possessed tact enough, and parental love coupled with firmness, to bring about in his child a preference for heeding parental admonitions, it makes no difference whether the parent is at home or abroad, for obedience will have been established as a personal adaptation. Behavior will follow preference and not fear of the compelling agent, and yet the child may have had to be whipped before the learning process could get started.

On the other hand, the child may have been told horrid stories of the forbidden region, and in that way a learning product may have become established which will control behavior. But in that case the adaptation will be a dread, or technically a phobia, and not obedience at all. Likely enough, a maladaptive structural learning has become established and the foundations of cowardice laid.

Again, many a child has faithfully been required to pick up his clothes every day, long beyond the pre-school years, only to give up the habit so fondly cultivated as soon as pressure and compulsion were removed. Re-

quirement was no doubt initially essential, but unless willing acceptance of consistent effort was established, the requisite volitional adaptation would not form. The sundry activities involved in the doing were but bits of training proper.¹

The major structural learnings of infancy seem to be those which have been discussed, namely:

Establishment of obedience
 Establishment of family affection
 Walking
 Talking
 Avoidance of danger
 Thrift
 Care for own bodily needs

There are not many of them. No doubt there are more, for this method of reasoning about them can never be exclusive. The most we can do is to conclude that here are learnings which are so important as to be structural in character and the child possessed of them will have an adequate basis for the development of integrated civilized personality. The important thing for our theory of education, ultimately for our theory of the curriculum of general education, is the importance and significance of structure.

Upbringing

The present volume is not a work on bringing-up children. Nevertheless, right upbringing is in all essentials an epitome of right instruction in school.

Now the race has had more experience in getting children into the world and bringing them up than in any other human concern whatever, save finding a food

¹ See page 34.

supply. Hence, there has been time for a great deal of common-sense to form and become a part of fundamental culture. Most parents living at the higher levels of civilization press toward these great structural learnings without any particular instruction as parents. Nevertheless, a great many parents become absorbed in watching the child's every act and suppressing him on each and every occasion. Such is the essence of "nagging." These people are vainly endeavoring to teach their children *what to do* rather than bringing them up to become the *kind of people who will know what to do*. On the other hand, parents who focus their firmness and tact and parental love on the few structural learnings, and otherwise leave their offspring pretty much alone, commonly succeed. One attitude is very likely to lay the foundations of a spurious or, it may be, perverted and unhealthy personality. The other is even more likely to lay the foundations of genuineness and sanity and success in life.

The pre-school structural learnings thus constitute the fundamental adaptations, which not only point toward ultimate adjustment — that is to say, sanity and civilization — but which constitute current adjustment as well. When they are established, the child is, other things being equal, growing up in adjustment. But that is not to say that education is finally established in all these fundamental respects in the pre-school.

The maturing process

Education is, no doubt, established in the case of the neuro-muscular art of walking and in the case of the language art of talking, for the individual will never walk or talk any more truly than does the normal child who is

three or four years of age or thereabouts. Mastery of these arts has normally taken place by that time.

In the case of walking, the child will improve in skill through practice up to the superb agility of the ten-year-old. He may improve in endurance up into the prime of adult life. He may take on other arts, such as swimming, skating, dancing, and the like, which are dependent on the fundamental adaptation of walking. But it is inconceivable that the grace and agility of the pre-adolescent could arise in a child who had never learned to walk; or that skating, swimming, and ski-jumping would ever appear in the halt.

Similarly, the individual talks better as he grows older, with practice, with expansion of ideational content, with the progress of intellectual integration; that is, language and logical coherence. Other speech arts may be founded on talking, such as written expression, public speaking, histrionics, and probably singing. It is absurd, however, to hold that the higher speech arts could be acquired by the dumb or on the basis of infantile babbling. True enough, the outstanding triumph of systematic teaching is the establishment of talking in the dumb, by the utilization of others than the usual organic pathways. Nevertheless, talking is a primary adaptation, whether it is taught or is untaught, as is normally the case.

It is much the same with the adaptations which arise through psychic as distinguished from physical co-ordinations.

The attitude of obedience, for instance, must be cultivated until it becomes developed into the full and intelligent obedience of the mature, civilized personality; but even so the fully civilized individual will never obey the laws of Nature any more truly than does the infant who

has truly learned to obey his mother. Furthermore, we are often made painfully aware that the wayward individual who has never learned to obey never becomes fully a civilized person, no matter how erudite or accomplished he may be in adult life, or even fully sane. Moreover, his waywardness is more than likely to lead to neurosis, which is a physical malady.

Similarly, the foundation of economic life, as well as one of the foundations of self-control, is laid in the primary sense of thrift exhibited by the child who has come to prefer to postpone eating some of his cake until later to eating it all now; and to conserve the cherished toy rather than experience the wild joy of smashing it. This primary learning would hardly suffice as the basis for the conduct of a great business or the administration of the public purse. Nevertheless, not even these immense operations could be carried on by individuals or by peoples who were devoid of this primary personal adjustment.

Finally, putting on one's own shoes and clothing and administering the requirements of the toilet seem to be trivial cultural attainments. And yet these intimate details of the individual life lie at the very basis of self-reliance. Anybody who has brought up children is aware, first, of their reluctance to go through the training which is part of the necessary learning process — easier to get mother to do it, easier for mother to do it than to insist; and, second, of the triumph of the child who can "dress my own self." The learning does not go far in the direction of establishment of the complete self-dependence which the citizen requires, but it is the essential first step just because it is so intimate. One could almost write the history of the decadence and final collapse of

ruling classes in terms of their failure to transmit this basal primary learning. Three generations from shirt-sleeves to shirt-sleeves.

Students of education, practitioners in the field of instruction, observant parents, have often said "give me the child for the first seven years and I care not who has him afterward." Of course, the statement is hyperbolic, for it makes a great deal of difference what influences reach the individual during even the first twenty-five years. The statement, nevertheless, contains much truth. There is no particular virtue in seven years, any more than in the first five, six, or eight years; the vital thing is the establishment of the pre-school structural learnings. It is probably true, however, that even five years is enough with the normal child under normal conditions.

Cultural background

Finally, the stuff out of which most later learnings arise, the ideational and sentimental content of the memory system, depends largely on childhood experiences within the family circle. The teacher must always be able to say "It is like this." If the pupil has nothing in his system of experience for it to be like, there is no learning. Content ranges from that of the utter poverty of the illiterate and primitive family to that of the richly cultivated and civilized home. Nevertheless, no richness of culture, nor material wealth, nor parental success in life, will take the place of the establishment of the pre-school structural learnings. The child of the rich and cultivated home often turns out an unbalanced and pitiful failure as a personality, while the offspring of humble circumstances achieves success in becoming adjusted,

balanced, integrated. We occasionally see a family producing eminently successful progeny, generation after generation. In such instances, there is probably a fortunate combination of good upbringing and a rich home culture. How much good genetic material in the biological sense has to do with it is another matter. The weight of the evidence to date seems to be that, save for specific taint in the family line, upbringing in its various phases, and instruction, are vastly more important than biological inheritance.

Critically important as the pre-school structure is, it is not the whole story of upbringing. Family responsibilities are not at an end until the child is launched on the world as a mature man or woman capable of directing his or her own destinies.

Nor is the issue settled for better or worse when infancy merges into childhood. The family may mend its ways, a foster home may replace the natural home, the school may conceivably repair the consequences of family neglect. Nevertheless, neglect of infantile learnings will in most instances inevitably incline the scales in the direction of ultimate educational failure, beyond the capacity of most schools, as schools now are, or foster homes, to repair.

III

THE VOLITIONAL STRUCTURE

As we have suggested in our schema of the fabric, the volitional structure is a large element in the backbone of personality. The reason is found in the principle that a large part of the adjustment which is produced in the rightly educated individual requires effort of some sort, not only in attainment but in application. The feeling

I can is typical of a whole class of adaptations. Add to that the feeling *it is worth while to do what I can*, and we have the heart of the volitional learnings.

If an honest man is presented with the opportunity of despoiling his neighbor of the latter's property, it requires no effort to refrain; to steal would be repugnant, an insult to self. If a person of culture is called upon to choose between a beautiful painting and a thing which is hideous in line and color, the choice requires no effort. If he has to choose between a rational line of conduct and one which is repugnant to reason and all his insights, once more the choice requires no effort.

Nevertheless, if he has to choose between a line of conduct which he knows will lead to better taste, better insight, better character, effort is required. The spoiled child is not likely to learn much in the sense of right education.

Again, if he has to conduct himself in line of duty in response to some generalized ideal, effort is required. Election day comes round. He knows as a matter of duty that he ought to vote, but there is neither compelling taste nor compelling insight. The situation is outside likes and dislikes, and so far as insight is concerned, he very likely knows that his vote will be negligible and perhaps that the issue ought not to be a matter of election anyway. But he goes to the polls because to that extent he is volitionally strong.

Finally, if one chooses between the daily grind and indolence, effort is required. He labors because he has learned to *prefer to do so despite the effort involved*. In due season, sublimation takes place and effort itself yields satisfaction; interest appears and irksomeness is no longer in the picture.

Nature of volitional learnings

Now all this suggests Will, what has always been conceived to lie at the heart of personality and about which more thinking and writing has been done than about most things in life. We need not quarrel with people who hold that there is something transcendental about Will, something which takes Man out of the order of Nature altogether. We can, however, point out that what they mean by the term "Will" is what we mean by mature and integrated personality as a whole.

We can in our time arrive at clearer views in the presence of this ancient problem, not because we are better thinkers than those who have gone before, but because scientific disclosures in the fields of biology, physiology, and psychology have thrown a good deal of light on what Will is not.

Will not a faculty. First of all, belief in the Will as a faculty is entitled to the same credence as belief in Memory, Imagination, or Reason as faculties, and that is no credence at all. There is simply no such thing as an indwelling entity called Will which is sometimes inherently benign, often inherently perverse, and which is subject to discipline and training. No more are there natively strong-willed and weak-willed individuals. We do, indeed, meet people who seem to have every appearance of being one or the other, but analysis commonly discloses that the former have learned the essential volitions and the latter have not. Not infrequently an allegedly strong-willed individual is merely negativistic; he resists change. So far from being strong-willed, he is the reverse, very often an individual in whom resistance to admonition has become structural, a perverse learning.

Not organic. The older psychology tended to note re-

flex action and then pass on and classify all other behavior as volitional or willed. Now, as we have seen, there is a vast field of behavior which has neither the mechanistic determinism of reflex nor yet the cultural character of personal behavior.

There appears here, in the first place, what we have called impulsive behavior. One feels a draft, looks about and moves his chair. A dog might exhibit precisely the same quality of behavior. There is nothing volitional about it.

In the second place, behavior which is a response to raw and unmodified appetite of some sort. One is hungry and he investigates the resources of the ice-box.

Finally, the forthputting behavior of men who are physically strong and vital is on first analysis merely appetite plus muscular endowment and high vitality.

It is doubtless true that, other things being equal, the physically strong and healthy are more likely to take on volitional adaptations than are the weak and sickly, just as, again other things being equal, they are more likely to take on other learnings. Nevertheless, the volitional attainments of physical weaklings often put their strong and healthy brethren to shame. One thinks of Macaulay's famous characterization of Luxemburg and William of Orange at the battle of Neerwinden. "It is probable that, among the hundred and twenty thousand soldiers who were marshaled round Neerwinden under the standards of Western Europe, the two feeblest in body were the hunchbacked dwarf who urged forward the fiery onset of France, and the asthmatic skeleton who covered the slow retreat of England." The annals of the sea are replete with instances in which physically weak but cultivated men and women have endured hardship

and sustained the spirits of whole boatloads of physically powerful but volitionally primitive sailors.

Not to be confounded with other elements in personality. What looks like volitional behavior is often behavior in response to other than volitional adaptations.

For example, our hungry man on reaching the ice-box finds that the larder is depleted and that satisfying his hunger will probably result in a scant meal for the family. He refrains, not as an act of self-denial, but because he has become the kind of person who dislikes to violate the comfort of others.

Again, I pick up my pen to write these lines. I would not do so had I not in childhood learned handwriting and subsequently become personally capable of entertaining a point of view which seems to need expression. No amount of will-power alone and no attainment of volitional learnings would have had the outcome which is before me.

Desire insufficient in volitional situations. The whole recent tendency to confine behavior within the domain of mechanistic concepts, psychical as well as physical, ignores the place of volition in personal structure, and in this region of thought tends to rest its case on appetite or else on acquired desire.

Now desire, even in the most sublimated form, is insufficient when it comes in conflict with indolence or with conflicting motives. Children do, indeed, tend to act in response to desire, and they are commonly frustrated in the presence even of play tasks which are within their competency, not because they *cannot* achieve, but because they *will not*; volitional structure is still infantile or at the best childish.

The life history of William III, to whom reference has

just been made, is illuminating in various ways and in none more than in its bearing on the present issue. William had learned early in life to hate Louis XIV and all the latter stood for. His consuming passion was to thwart the French king. But attainment of desire meant schooling himself to untiring effort and to enduring an endless succession of harassing mischances. So it is with all of us. Appetite may be sublimated, so that we no longer desire what formerly we did desire. If that is the pathway of adjustment to social circumstance, it is also the pathway to sane and civilized personality. Nevertheless, healthy desire as well as raw appetite can often be realized only through stern effort founded on a mature and tough volitional structure. Failure to achieve satisfactory sublimation of raw appetite may easily land one in jail, if justice be done. Failure in volitional learnings is likely to result in continuous frustration and in due season, *I cannot* becomes structural. The individual lacks confidence and initiative, not because he was born with any such lack, but because he has never acquired the structural learnings upon which they depend. Even so, definite maladjustment of that type may be more endurable than the increasing meanness which goes with constant frustration in people who have not even made up their minds that they cannot and learned to accept the universe, at least for the present, in that way.

The implication in upbringing and instruction is not that children and young people should never be allowed to fail, but rather that they should learn to face failure. The decision "I cannot" ought always to be met with the requirement "You can and must" — unless, indeed, the task is beyond their powers, and then the admonition should be "Don't try until you are old enough to attain."

Specific character of volitional learnings. We often hear it said that children should be taught self-denial and self-assertion, that "initiative ought to be developed." That is a good deal like saying that children should be taught to think. These are but vague terms and they may imply mischief.

Children do not learn to think. Thinking is inherent in all normal people. They acquire experience to think about, an intelligence upon which thinking can be founded, and above all the methods under which accurate thinking is done; but these are the learning products and not thinking.

Similarly, children learn obedience, thrift, caution, care of their primary bodily needs, capacity for team work, sustained application to tasks which are initially unappealing, fortitude, acceptance of criticism, sense of duty, punctuality, acceptance of consequences of their own acts. These are the great structural elements, or at least some of them, in the volitional structure of personality. Having taken on such personal accretions as these, the person is "strong-willed." He exercises self-denial where self-denial is appropriate and initiative when initiative is right.

IV

THE THOUGHT STRUCTURE

The other half of the backbone of personality is what most advantageously can be apprehended as the structure upon which the thinking of civilized people primarily depends, namely, language, graphic representation, and mathematics. Let us bear in mind that the essence of personality is adjustment to constantly changing circumstance and that *thought* is on first analysis the personal process by which such adjustment is achieved.

From the standpoint of the sociologist, these arts are doubtless looked upon primarily as means of social communication. So they are, and even more, for they represent the primary integrating mechanism of civilization itself. But mature and sane personality after all is to the individual what civilization is to society; and it is personality with which we are concerned. Man is incomprehensible outside of society. There could be no human thinking, if men were and always had been solitary. The individual communes with himself as well as with others in terms of social institutions.¹ In the fabric of civilized personality these particular institutions are the elements of thinking capacity.

Language

We have caught the beginnings of language in the mental process which we call speech. Speech is untaught and it ordinarily ripens as an adaptive process in the normal child within the first two years. As, however, the baby learns to talk, he also learns a language. Language is not a mental process, but a social institution.

Now, all languages have some sort of linguistic structure. Philologists are able to tell us how even the language of primitive people is put together. Nevertheless, in linguistic evolution, it was a long time before language forms came to be capable of being put into written discourse of some sort and still a long time before the kind of phonetic written language with which Western peoples are familiar appeared. It is only such languages as these which are flexible enough and exact enough to be used as the ready vehicles of thought — and of sentiment too — and, it may be added, easily enough learned. Modern

¹ See C. H. Judd, *Psychology of Social Institutions*.

essay writers, in their wonder at the rapid advance of civilization in Greece during a few short centuries, are prone to ascribe to the Greeks superior mental powers, in brief, "better brains." I trust that our studies of the adaptive organism have gone far to disabuse us of that delusion. The cultural superiority of the Greeks was the superiority of the Greek language as an instrument of thought, the first modern language. It is worth remembering that the other chief form of symbolism in which we do our thinking, the Arabic number system, came to us, not from Greece, but from the Orient, probably India.

In attempting the rather uncertain task of drawing the line between barbarism and civilization, most students who draw the line at all draw it at the point at which a workable written language appeared.

But language as an instrument of effective communication and as an implement of thought is a product of social evolution. Any given language, our own, for example, had a beginning and it is liable to decline. Hence, the folly of the easy tolerance which picks up the phraseology of the primitives in our midst and encourages thereby the debauchery of a highly developed tongue.

Reading. When the pupil in the primary school takes on the art of reading as a personal adaptation, he short-circuits several thousand years of cultural progress. There is, however, no adaptation unless he comes to read through the printed page to the thought or sense or story behind it, without focal consciousness of the elements of discourse, such as words, forms, phrases, and the like. Otherwise, he is merely learning adaptive responses in the form of stringing together isolated words, with the result that either he cannot react to the meaning of what he reads or else does so in a roundabout and uncertain fashion.

When, on the other hand, he does read, he thinks the thoughts of the writer and thus shares in the accumulated cultural capital of the race. Hence it is that acquiring the insights which come from a science is learning to read that science; learning the tastes which come out of literature is learning to read literature; learning the tastes which come out of music or one of the pictorial or plastic arts is in part learning to read about music or the art in question. Qualifications must be noted. Learning to read poetry is learning a derived language, a matter of catching rhythm and metrical values and cadence. Learning to read music is learning a different language.

Reading is structural. Everybody who expects to be civilized at all must learn to read some language which is itself capable of carrying the thought which civilization requires. Nevertheless, perhaps no two persons who have learned to read will read the same things. Hence, different minor learnings will cluster about the structural learning which is common to all.

Written discourse. The only available means we have of preserving thought and getting an objective picture of our own thought or that of another person is through some form of written language. Doubtless the time may come when we shall pass from typing our thoughts to recording and transmitting oral utterance mechanically, just as many people have passed from handwriting to typing. But whatever the device, it will always be language that will be recorded.

As soon as the pupil in possession of language rises into the field of cultural learning, most of his reflection is done in unvoiced or even uttered language — thinking aloud. At the best, it is done in the deliberate thinking which written expression makes possible. In that way

he short-circuits not only ratiocinative processes proper, but thinking in the canons of taste which he has built up. In all probability, civilization could hardly have got started apart from this property of language in personal use; nobody could live long enough to think out the elementary problems of life.

Command of written discourse is then a structural element in civilized personality.

Spurious learning. As we have already seen, the higher forms of spoken and written discourse lend themselves very readily to spurious use. In the genuine use of language, we slip along through a symbolic reflective chain without the necessity of forming concepts from word to word, but we place our feet on the ground from time to time to check up and make sure that we are not parting company with our valid conceptual basis. It is exceedingly easy, however, to do nothing of the sort, but rather to run through a long discourse which has no meaning at all. It sounds as if it meant something and that is all.

Discourse structure. The essence of speech as an adaptive process is in its universality. If no two people spoke the same tongue, it would be the same as if no speech existed. So it is with organized language. So it is, to a degree, when no two people mean exactly the same thing by what they say, and their minds do not meet.

Now language was not invented; it evolved. It is quite beyond the capacity of any kind of statutory enactment to establish common meanings. Universality under civilization rests upon the principle that civilized languages have a structure which is inherent, a reflection of the fact that accurate thinking has to be coherent. The continuation of civilization, as contrasted with intellectual anarchy, rests upon the transmission of aware-

ness of language structure to those who participate in civilization.

We are accustomed to structure in our own language in the form of accepted spelling of words; right and defensible use of words; a few conventional signs which we call punctuation and which on the printed page convey the meanings which are conveyed in spoken discourse by interruptions or pauses; and the coherency and definiteness in sentences which are governed by what we know as the laws of grammar.

And so the insights and fixed responses which constitute our sense of discourse structure are structural elements in civilized personality.

Graphic representation

In the preceding chapter, we have seen that symbolism is an essential adaptive process in Man, part of his mental functioning. So it is with speech, a form of symbolism; and so it is with the representation to himself and others of concepts by means of lines and color. But speech does not get society far on the road to civilization without language, and language has to be learned. Graphic representation remains merely a matter of crude gestures, apart from the learnings founded on the art of drawing and its derivatives.

Now, while language gives us our generalized medium for thinking, we often need to think, not only in space relations, but in space relations which stand for quantity. We cannot do that save in the appropriate medium. Primitive man apparently discovered the principle, although he of course did not formulate it, and graphic representation appears in the monuments which he has left behind him.

Note, however, that graphic representation which is serviceable in thinking is not a system of conventions any more than language is such a system. It is a cultural product and the outcome of long ages of experimenting and the formulation of experience until forms have been found which in fact do represent external reality through the mental processes which are common to all men. For example, the representation of a box by an arrangement of lines on a flat surface accomplishes its purpose, not because people have ever agreed that it shall, but because under the laws of perception such an arrangement of lines does in fact represent a box.

Again, some of our experience comes to us in forms which are translatable into triangles or parallel lines or spheres; that is, geometrical figures. But these are external and a part of the world which we learn. If we entertain valid notions in which these are concerned, we can do so only through the insights in which are revealed the nature and laws of these and similar space forms.

Hence, some of the structural elements of mature, civilized personality are derived from the art of drawing as a school subject and from understanding of space as it is revealed in geometry. More than that, they lie within the fundamental thought structure which is part of the backbone and integrating axis of personality. As structural elements, they make minor learnings possible and determine what they shall be. How true this is can be seen by anybody who chooses to observe persons who are cultivated on this side. The latter see things that others of us do not see. They apparently get more enjoyment out of the phenomenal world. Other things being equal, they think more accurately.

Mathematics

Closely related to language and graphics as serving a symbolic function in the process of adjustment is mathematics, perhaps the highest form of cultural attainment.

As soon as a young pupil learns the system under which counting is done, becomes the kind of person who counts, one of the major structural elements in civilization is added to personality. He becomes capable of a great many minor learnings in the field of his particular experience and he excludes a great many false learnings. Above all, he takes a step in thinking capacity. He no longer says to his playmate, "This is more than that," and prepares to justify his convictions by combat. He rather says, "Let's count and see."

Similarly, with the common processes in arithmetic and the common systems of measurement. They enable the person to think out, as he otherwise could not, novel situations the essence of which is quantity. And so with the elementary processes of algebra, trigonometry, and perhaps the calculus.

These are structural and common to all who are fully educated. Nevertheless, any two pupils, in both of whom the structural element — of addition, let us say — is present, will differ widely, both during the period of pupilage and in maturity, depending upon the minor learnings which varying experience, varying temperamental proclivities, and varying organic capacity have made possible. Only, if the structural element is present an extended range of minor learnings will become possible for both pupils and for both there will be a guaranty against maladaptations and perverse learnings.

Thus, the central axis of personality in its volitions and

thought structure, the core of internal adjustment and the center of integration, the heart of the civilized self. We turn, then, first to the great structure of value attitudes or appreciations suggested by Column II in our scheme and, second, to the intelligences represented by Column III.

V

MORALS

The fundamental learnings which more than any others make the individual a safe member of society are what are commonly called morals. They concern the values which he attaches to his relations to his fellowman. Together with volitions they make up the structure upon which *conduct* fundamentally depends, and for that reason I have elsewhere grouped them as *Conduct Attitudes*.¹

Meaning. The word "morals" has had an unfortunate history, and it is therefore worth while to see exactly what we mean by it, at least as an element in personality.

The word is derived from the Latin *mores*, which meant pretty nearly what we mean by "manners." When Cicero ejaculated: "*O tempora, O mores!*" he meant much what people still mean when they say, "Oh, these times and the ways people have!" He was quite explicit in what he meant by *moralis*, for he once said that he thought that the Romans ought to adopt the word to signify what the Greeks meant by *ἠθῆ*, and the Greeks meant what we mean by "right" and "righteousness." We have the word, "ethics" from the Greek. Incidentally, the evolutionary proclivities of the Greeks apparently led them to use a word which signified the result of a sifting process.

¹ See *Practice of Teaching in the Secondary School*.

Now, the sociologists have tended, or at least some of them have, to mix morals with customs, and folkways and "mores" have come to have technical meanings. It is doubtless true that morals, as most people use the word, have evolved out of mores, or popular ways of looking at the world and its obligations, but not all mores are morals, nor have all mores necessarily any moral connotation. For example, a few years ago it was held in the United States to be objectionable for women to smoke, but none but bigots even then held that there was anything immoral about it. The mores have greatly relaxed in that respect. On the other hand, we can scarcely claim that a given community is civilized unless essential morality is part of the mores of that community; any more than we can hold that it is civilized unless the common intelligences are ingrained in the mores.

The story is materially different with the folkways. Keeping to the right in traffic is a folkway, where it is not prescribed by ordinance. Out of the folkways have evolved many of our institutions, but not all folkways are institutions. They serve a useful end, but they are not necessarily universalized and permanent.

Again, morals are frequently confused with laws and statutory or canonical prohibitions. The law itself draws the distinction between what is evil in itself — that is, immoral or unrighteous — and what is merely evil prohibited. A good many loose thinkers and writers, finding that among primitive peoples taboos, prohibitions affected with religious sanction, were placed on certain acts which we should today consider inoffensive, draw the conclusion that all morals, to say nothing of religion, are as out of date as a Polynesian taboo. A taboo was a primitive statutory enactment or perhaps rather a primitive

ecclesiastical canon. It may have been useful, just as a multitude of statutory enactments are useful, and yet without any moral implication, unless indeed the thing prohibited is in itself immoral.

Personal structure. Now, in the long process of the evolution of civilized man certain attributes of personality have developed without which there is no civilization, or else no moral personality in individuals who live under civilization. Among others these are: concern for the well-being of others, sense of fair play or elementary justice, property right, decent concern for the opposite sex, fidelity to promises. These are so fundamental that they have often been called natural, and individuals lacking them are considered to be moral imbeciles. They penetrate deeply into the constitution of the self, so much so that individuals who lack them, unless indeed the latter are merely physical brutes, are constantly in trouble, both inwardly and outwardly. They constitute the basis of doing right because it is right. Violation of them is the basis of the affective disequilibrium which we call remorse. In these senses, they are indeed natural.

They are structural and good for any kind of situation which may arise.

Fundamental morality is the product of social evolution in exactly the same sense as language or graphics or mathematics is. It was never invented nor yet grew up as the product of prescription. Just as methods of representing a solid by lines on a flat surface are universal because they satisfy the laws of perception, so morals are of universal validity because they furnish the only possible common measure of social intercourse. When people hold morals to be conventions or hold that given moral values represent only the average judgment of the

period, they are mistaken. Socrates laughed that idea to the scorn of all time more than twenty-three hundred years ago.

Contrast with ethics. Now, these fundamental elements of righteousness are to be distinguished from ethical learnings. Generally speaking, the latter can be thought of as particular and functional.

Of the structural learnings here, concern for the well-being of others is perhaps the most comprehensive. Now altruistic inclination is one thing; awareness of the effect of one's acts on others is quite another. We often hear it said, "How shocked that person would be if he knew what that behavior is doing to other people!" We feel sure in such instances of essential personal morality; that he is inclined to do right by others. We know that his lapses are due to ignorance. On the other hand, however, we unhappily encounter people who have no concern for others, no inclination to do right by them. In so far as their conduct is acceptable, it is because of hope of reward or fear of consequences. They are morally spurious.

Right conduct is therefore based, not only on sound personal inclination, but upon awareness of the effect of behavior. Hence arises what we call *ethical judgment*; that is to say, discrimination as to what in reality constitutes right conduct, wherein and how our neighbor is affected by our acts, wherein and to what extent a promise has been made or implied.

Ethical sources. The possibility of ethical discrimination as such is then largely a matter of taste and intelligence. This act will hurt A because he is a person of refined tastes and my own standard of taste makes me aware of the fact. This act will hurt, not only B, but every-

body else, because, under physical, biological, or economic law, it must do so.

It is seemingly a far cry from ethics to chemistry and bacteriology and general biology, and yet it is probably true that the greater part of advance in ethical culture during the past century or so has come from increasing popular intelligence derived from these fields. The truth of this assertion can be illustrated from the spread of the ethics of health and of the treatment of the dumb animals.

A hundred years ago, fundamental personality was not materially different from what it is today. There were probably just as many people then who were inclined to do right by their neighbor as there are now — more, for all we know. Nevertheless, infections and other diseases ran riot by reason of acts which would bring offenders into court today. Treatment of the insane was one universal horror. People knew no better; health intelligence was not in the mores. One of the conspicuous triumphs of public instruction is the diffusion of intelligence concerning the nature of disease.

Again, save in isolated instances, dumb animals were treated with callous unconcern. Interesting, beautiful, and useful wild animals were exterminated to gratify casual whim. People were apt to be concerned with their domestic animals only from motives of profit and loss. Much more recently than a hundred years ago, women could not be persuaded not to gratify their vanity through ornaments which cost the agony of untold thousands of beautiful birds. The change in the mores has been very great, and the reason is not far to seek. Since 1859, civilized people have undergone an intellectual transformation in that they have come to understand that the lower animals are kindred to ourselves.

Inclination to do right regardless of consequences is then fundamental and structural; decision as to what is right is ethical and functional, and a matter of cultivated taste and intelligence. Herein we catch a glimpse of the real utility of the arts and sciences in the curriculum of general education.

VI

HUMANISTIC VALUES

Among the values which are categorically appreciations rather than insights, and in the emergence of which the adjustment process is sublimation of crude likes and dislikes rather than ratiocination, are volitions and morality. We can identify a third class which it is convenient to distinguish as *cultivated tastes*, or appreciations in the presence of the beautiful, the good, and the true.

The beautiful

The normal child begins to discriminate between the beautiful and the ugly at five or six years of age, but his discrimination is crude and it normally ripens under the learning process only as he falls under the influence of good upbringing and instruction. More than that, he does not develop any such thing as a general sense of beauty, but rather he takes on specific senses of beauty as his attention is directed thereto under teaching of some sort. Here it is beauty of line and color as he finds them in Nature, in clothing, in the appurtenances of the common life. There it is beauty of diction, rhythm, and cadence as he finds them in literature. Again, it is beauty as beauty is found in music and the various fine arts.

The good

When we think of the good in the sense in which we are now using the word, we have not in mind morals or ethics, but ideals which are not necessarily ethical in implication nor classifiable on any logical ground whatever. That which is ethical is good, but not all good is ethical. We think of examples of noble conduct and aspiration and living, of that which Man feels and always has felt chiefly distinguishes him from the brutes. The supreme manifestation of this side of life is religion and faith, if so be we can attain thereto. People who have grown up devoid of perceptions of goodness and devotion thereto are what we sometimes call cads. Happily, there are comparatively few out-and-out cads in the world.

Not the subject matter of science. No doubt in the cases of both beauty and goodness, we have good scientific ground for understanding wherein they have originated. We have dealt with that, particularly in our study of affective processes in the adaptive organism. But to say that science can demonstrate what is beautiful or good, or persuade us by rational process to accept a particular beauty or good, is little short of sheer nonsense. To hold that these things are within the domain of science is to hold that the ornaments found in Egyptian tombs cannot be beautiful, nor the majesty of Greek architecture and sculpture, nor even the flower and waterfall and mountain peak. Assuredly these beauties antedated the age of science. One could scarcely hold that the goodness found in the lives of men like Socrates and Saint Francis and Abraham Lincoln was the product of scientific analysis and construction.

The true

And then the true, as appreciation. Just as goodness transcends and is more than ethics, so the true is more than the intelligence which arises out of insights derived from positive science. Here we encounter the wisdom of the world, and we are likely to find genuine bits of it in the untutored and unschooled. We find it in the most ancient writings of India, China, and Judæa, to say nothing of those of Greece and Rome. It is what makes Dante and Shakespeare, Schiller and Goethe great, and a host of minor witnesses ancient and modern as well. King Solomon was annoyed by the lack of it and he called the latter folly and its prophets fools — not *morons*, but *fools*. A moron is an individual who is organically incapable of wisdom; a fool is one who has refused or neglected to become wise.

Now, these things, as well as our fundamental morality and volitions, are the product of cultural evolution. They are not matters to be settled by investigation and report any more than the validity of the human eye or heart is a reasonable subject for the deliberations of a Presidential Commission. They are indefeasible parts of the fabric of civilization and of civilized personality. In large part, they define civilization and personality.

As structure

Just because the whole domain of the cultivated tastes defies logical classification and definition, in seeking for the pathway through which instruction can proceed, we must turn to the sources and find our structural elements there rather than in the elements of taste themselves.

True enough in the fundamentals of æsthetics, and indeed of the beauties of Nature, we can find certain

canons — of line and color, for instance — and set them up as structural. Whitford has suggested how this can be done.¹

In general, however, the structure of cultivated taste seems to be in the great literary and musical and artistic forms in which the culture of the race is recorded and transmitted. We gain access to the capital of the good, the beautiful, and the true which is preserved in literature by learning to discriminate between the excellent and the tawdry as it is found in the novel, the drama, the essay, the biographical account, and to prefer the excellent. And so with music, architecture, painting, sculpture, dress, furniture, ornamentation. These are the channels of vicarious experience out of which learning can arise.

Appreciations in these forms and in this sense once mastered, we go through life accumulating a multitude of tastes and incorporating them into personality. As Cicero said long ago in a passage which has been inscribed on the walls of a thousand schoolrooms: "These pursuits nourish youth and give pleasure to age; they adorn prosperity and offer a refuge and solace in adversity; they delight us at home and do not distract us abroad, they pass the wakeful hours with us, they travel with us, they go on vacation with us."

It is a bit ridiculous to suppose that all the elements of goodness, all the perceptions of beauty, all the items of wisdom which the race has accumulated in its evolutionary pilgrimage can be listed, job-analysis fashion, and taught in school. We can teach the sources, but not the things themselves.

¹ W. G. Whitford, *North Central Association Quarterly*, March, 1932, vi, No. 4.

VII

INTELLIGENCE

The central structure of volitions and symbolic learnings, upon which all possibility of integration rests. Then the moral values and cultivated tastes which bring the individual into adjustment with the essentially humanistic side of the world. But these adjustments are not enough. We live in an ordered universe which can be controlled and adjusted to only by learning its laws and obeying them. Hence, a structure in personality which we call intelligence, or the product of learning how the world is put together in terms of positive science.

Now Man became a humanist long ages before he became a positivist and took on the scientific attitude. Advanced Orientals long looked at the world as the realm of fate. Here we are; we can achieve some sort of happiness; but in the end we are tossed on a sea of circumstance. Nothing can be done about it; Nirvana is the supreme good. Not so the typical Western man. His answer would be, "Granted, but what are you going to do about it? Let's find out." Western civilization has in consequence achieved most of the great escapes and is still confident that in the end all will be similarly achieved. The method has been learning the why of things and being governed accordingly. And yet the starting-point is not in intelligence at all, but rather in the volitional learning of being willing to accept the principle that one's acts have consequences.

The primitive looks out upon the world of mischance as a realm in which *agency* reigns supreme just as it does in the human world with which he is familiar. He has no concept of *causation*. If the storm flattens his crop,

somebody must be to blame. Perhaps his enemy has got even with him through witchcraft, or perhaps a demon did it whom it will be expedient to propitiate. And so with all his contacts with the order of Nature.

Now we are still in the process of emerging from the primitive in this respect. It must be remembered that while the Greeks and Romans made some progress in adopting the positive attitude toward the world of Nature, their science never made progress enough to become particularly convincing to the average man in society. Then came a lapse of a thousand years, and when the Western world began to recover an intellectual outlook, it was still six centuries before the latter had established much of a place for itself in the mores. The final disappearance of trials for witchcraft may perhaps be looked upon as symptomatic of the changed point of view. Truth to tell, a great many persons are still so far from being civilized that they center on agency instead of causation, albeit they would not admit a belief in witchcraft.

Mechanics

It is probably true that intelligence with respect to mechanical appliances and all sorts of applications of physics and chemistry is more widely diffused than any other form. Few people any longer have faith in the rule of agency in that field. Even the mechanic's incantations over a refractory valve stem are profane rather than religious.

Health

Next would appear to be health and the nature of disease. And yet it is not long since a great many people could be found who believed implicitly in the influence of

spirits and even the machinations of neighbors as determinants of bodily well-being. I myself once got into trouble with a medical man, no less, because I scouted the idea that a howling dog is a harbinger of death. Still, most people believe that if you drink tainted milk or water, you are likely to be sick.

Living things

Less secure in the mores is the outlook upon causation as having a place in the nature and development of living things. On the whole, most of us believe that like breeds like, but the great majority of people are still reluctant to accord Man a place in the order of Nature and to believe that even ideas follow a sequence of cause and effect. Some of us hypertrophy in our intellectual outlook and come to be unable to see anything else in human existence but causation as causation is in physics and chemistry.

Society

But it is in the domain of society, and in our outlook on society, that we find most primitives, even among the classes which are accounted educated. The notion of agency is still dominant. Most people are prone to believe that some malign influence accounts for adversity and misfortune. The history of representative government still shows an almost unbroken tendency for the administration which is in office in hard times to be thrown out, and conversely the government in power in times of prosperity almost invariably claims credit for good times. Throughout the greater part of the Western world, people are still infatuated with the idea of agency to such an extent that they have implicit faith in the power of government to remodel human nature by statute or by executive

decree and so to order society that people individually and collectively can be saved from the consequences of their own acts. This is nothing else than the primitive faith in folk heroes and sun gods.

There is a parallel here to the primitive attitude toward the order of physical Nature; only storm and flood and earthquake are so impressive that barbarians have seldom trusted anything lower than deity as the healing agent. There is a better parallel to the primitive attitude toward disease, and the latter is still so frequently found that one scarcely ventures to mention it. Incantations, witch-hunting, propitiatory rites, resentment at medical treatment as embodying irreverence, are all of them so recent, even in supposedly civilized communities, as to be within the memory of people who are still living.

Unhappily, miscreants have always capitalized the unintelligence of the masses and they still do. The demagogue rides into power on the strength of promises that no man can make good. The quack grows rich on the faith and necessities of the unenlightened. The charlatan's box-office receipts seldom show signs of drying up.

Antiquity of the social sciences. And yet, save for modern sociology in its various branches, with its disposition to collect significant facts, the major social sciences — civics, economics, and jurisprudence — had made a good deal of progress as normative sciences long ages before there was any physics, chemistry, or biology. It is worth recalling that in the *Institutes of Manu*, perhaps 1500 B.C., there is a sound theory of taxation which most of the American commonwealths would do well to adopt. The Greeks and Romans evolved a theory of the State which in many respects we still follow. The Romans put jurisprudence together in a system which

is the basis of most of European public law and of much of the law of the English-speaking nations.

And yet personality has evolved much farther in its fundamental structure, in morals, and in cultivated taste than in intelligence. Why? The reason is to be found in the fact that in the family and in the school civilization in the fields first mentioned has been more or less faithfully transmitted for centuries, while in the latter a beginning has barely been made. One need not be very aged to recall the fight of the sciences for any place in the curriculum at all, and science is beyond the capacity of most homes. The physical and natural sciences have, however, found a place within the past generation, and the effect in the mores is already unmistakable. Not so the social sciences.

But this is anticipating. After all, we are at present concerned with the fabric of personality and not with the curriculum.

Structural elements

It follows, then, that the critical structural elements of intelligence in adjusted, civilized personality are derived from the major sciences — history and geography, which have long been the matrices of the intellectual side of culture; physics, chemistry, and biology, human physiology and hygiene; civics, economics, and elementary jurisprudence.

Now it is pertinent to emphasize "derived from the major sciences." Teaching physics and chemistry is one thing; developing in pupils the intelligent attitudes toward the world which are derived from physics and chemistry, and which are essential to general education, is quite another. It must be borne in mind that the

great body of principles which are found in science are technological in import and outside the requirements of personal intelligence.

VIII

INDIVIDUATION

Thus the fabric of personality in its structural and minor individual learnings. So far as the structure is concerned, if our reasoning be sound, it is common to all civilized personality. It constitutes the adjustment to external and internal forces which has long been evolving to match and control evolving culture, the only adjustment we have. It is the taking-on of civilization, and civilization is to society what sound and mature personality is to the individual. We have noted the minor, individual learnings which the structure makes possible and controls. We have seen that the latter must vary as organic temperament and adaptive capacity vary and as experience varies from individual to individual, and that nevertheless if the structure be sound the individual learnings will tend to be sound. At the risk of tedium in illustration, we recall a patent instance.

The pupil learns to read. Reading is reading whoever reads and none would question that all must learn. As soon as the pupil reads, he has a tool for acquiring vicarious experience and out of experience learning may emerge. Nevertheless, no two will read the same things and hence no two will find the same experience. Indeed, they will tend to differ much as they differ in the reliability with which the fundamental common adaptation is established. More than that, they will differ in the extent and scope of individual reading. Thus, the structural element makes a great deal of new experience possible, but it does not guarantee experience.

Now, in the good family and the good school a second structural element enters, namely, taste for good reading, and in that way control of learning is set up. The new element, however, enhances rather than checks variability. After all, tasteless reading is much the same. Inferior juveniles differ but little from generation to generation and the sameness of mystery stories is a byword.

And so the principle runs throughout the curriculum of general education.

Dread of uniformity

Essay writers decry the deadly uniformity of the product of our school system and they are pretty likely to complain that children are all taught the same things and that is the reason. If personality is really in a state of deadly uniformity and uniform curriculum is the explanation, there must be a screw loose in the reasoning somewhere, for there are few people living in the United States today fifty years of age and younger who have ever had any experience of uniform curriculums. The elective system has been prevalent ever since elderly people were in school, and the generation which is now becoming dominant, or at least conspicuous, has in large part been the product of complete educational *laissez-faire*. It looks as if the more varied the schooling, the more uniform the product. And there is a good deal of truth in the surmise.

Uniformity of primitives. Now, it is fully civilized people who exhibit maximum individuality and not the unschooled. Let us see.

Of all the lower animals, those which come nearest to being "human" are not the higher primates, which are organically nearest Man, but the dog and the horse which have longest lived in intimate fellowship with humans. I

am not hardy enough to venture the assertion that dogs, for instance, do not exhibit individuality. Some are clever and some are stupid. Some are friendly and some are pugnacious. Some are mean and some are noble — albeit meanness in dogs is usually the result of mean treatment. Saving the last statement, individuality in dogs is a matter of temperament. None but infatuated dog-lovers would contend that there is any great difference in different individuals of the same variety. All shepherds are much alike. So are bull-dogs and terriers and setters and what not. At least, they are more alike than any humans.

Those who have much to do with the primitive races of mankind have usually been impressed by their lack of individuality. In common parlance "they all look alike to me." That there is individuality nobody can doubt, but the range is not great, save in those instances in which some civilization has been taken on.

If we look for "character," in the sense of individual peculiarity or color or quality, in our own country, we go to those sections in which circumstances have made discipline severe and where uniformity of individual standards is a proverb. Given the discipline of life which has produced the bases of civilized existence, you will very commonly find the twinkling eye, the quaint expression, and withal iron-bound self-dependence.

But come to the great city in which variety of circumstance is at the maximum and in which schoolmasters have painfully sought individualism, and see what has happened. The greater part of the population has reverted far toward primitive uniformity. They dress alike, act alike, think alike, talk alike, change alike; and they come to look strangely alike. More than that, whereas the "charac-

ter" of some of the backwaters is independent, these folk have a dread of being different which amounts to a phobia. These are products of life experiences which have been all individual learnings and no structure.

Come once more to the highly civilized men and women, for instance, who gathered at the White House in the time of Theodore Roosevelt — and their like who form intimate circles here and there throughout the nation, sometimes in the homes of wealth, sometimes in homes of straitened circumstances. Such people have much the same qualities as the "characters" of old-time New England or the Texas range. The former are cultivated, the "characters" often were not. Both classes are sure of themselves, they are structurally sound in the elements of civilization and common standards, they are highly individuated because their personal structures have made rich and varied bodies of genuine individual learnings possible.

Above all else they are individualized as well as individuated. That is to say, they are *integrated*, and that is what delivers them from eternal compensatory behavior. The "independent farmer" or rancher or lumberman may be crude and not highly civilized, but at least he is apt to be personally sound; he is not troubled by "inferiority complexes."

Structural learnings and the curriculum

Manifestly, then, the content of the curriculum of general education must be the structural elements which enter into personality. In so far as upbringing and instruction succeed in producing an individual who meets the test of all the evolutionary processes which define what any form of life must be, they do so only by building

a personality whose structure is the essential institutions which have evolved during the long process of social experimentation. The individual becomes educated by becoming civilized, and he becomes civilized by learning to obey rightful authority, by learning to regard the rights and needs of others, by learning to read, write, and cipher, by learning the elements of the arts and sciences, the moral, and volitional religious attitudes which make up the fabric of civilization.

And yet there is more to it than that, for personal integrity, which is only another name for sanity, is quite as important as external adjustment. We turn, then, to a study of *integration*.

CHAPTER IX

INTEGRATION OF PERSONALITY

IN THE preceding chapter, we have studied the fabric of personality, in much the same way as we might have been studying the anatomy and growth of the physical body. But that is only half the tale. We now turn to a consideration of the way in which personality is put together as a working whole, to its physiological plan if you please.

All normal and healthy animal organisms, at least since a remote point in the evolution of the metazoa, possess individuality. They are put together in such wise that all their parts act in co-operation. They are "all members, but one body." They act as wholes, they are made into one, they are *integrated*. They are individuals and not mere aggregates.

So it is with normal and healthy personality, which is also an organism. Adjustment is not merely learning a measure of this and a measure of that until the educational prescription is filled. It is rather the attainment of moral attitudes,* tastes, insights, in relation to the attainment of volitional and symbolic capacity, until the person is rounded out into an individual.

Now in the concluding pages of the last chapter we have devoted some attention to individuality as opposed to uniformity and have shown how diversity must come about in the sound personality. Nevertheless, there is this more fundamental use of the term, based on the thought of general physiology, in which individuality as the product of integration is emphasized. Therein is

contained the notion of strength, which we all admire and to which we all aspire. I suppose that a society made up of persons who were all of them strong and all alike might conceivably be a good society. Diversity is not in itself admirable; strength is. A society made up of such imaginary folk does not exist under high civilization, not because it is undesirable, but because it is impossible.

I

PROCESS

To discuss integration *in extenso* would be tantamount to giving our minds, not only to the whole theory of education, but to the whole theory of sanity as well. Integration implies disintegration and disintegration is a phenomenon with which the psychopathologist has to deal. We can, however, form to ourselves some sort of concrete picture of the process of integration in the fabric of personality and of the educational implications.

Normal condition

Now integration as a process is indefeasible in the same sense in which personality of some sort is indefeasible. Throughout the evolution of any species, the urge of adaptive circumstances is toward integration. Thus, we have the law of organic selection or coincident selection. A flexible hand and flexible vocal organs imply a nervous system and entire bodily structure which will take care of the functioning of hand and voice so be it that the latter prove useful in superior adjustment. A heavy cerebrum similarly implies an erect posture.¹ So powerful is the stress set up by integrational necessity that if some of the lower organisms be injured at birth, the result will be,

¹ See page 78.

not merely a missing part, but a monster, an individual put together in a wrong way, but put together somehow. So it apparently is in the case of intra-uterine injuries in mammals or in the case of genetic defect in a particular part.

And so it is with developing personality. The fact that a child has acquired under education a particular trait makes it pretty likely that another implied by the first will be taken on. Hence, if we could fully control the experience of children, they would tend to integrate of themselves. Most of them doubtless do so. But in a complex cultural medium, especially in large cities, we cannot control their experience. They will associate with their contemporaries, they will go to the movies, they will read the newspapers.

Dominance in volitional structure

Now in the physical body the basis of integration is in the principle of head dominance, in the condition of polarity set up by the vertebral column, and in the action of the nervous system.

In much the same way, the volitional structure and the basal thought structure seem to serve the function of dominance and of vertebral arrangement in personal integration. In this way:

A boy has learned the nature of infection and of germ-borne disease in his elementary hygiene. As a matter of insight alone, we will suppose that his learning is genuine. And yet he is still so volitionally childish that in a boy's summer camp he gets a bad infection from scratching himself with a dirty fish-knife and ends up by contracting typhoid fever from drinking water which is known to be probably impure. He knows better, but

he will not do better. So far as education is concerned, it is the same if he had learned nothing at all.

Again, another pupil has learned to read. There is no doubt that he can read, but he will not. In class, he learns only by listening to other pupils; at leisure, he will read only stuff which appeals to native fancy. Whatever else he may eventually become, he will never be a student nor a fully developed civilized person, unless volitional structure be seasonably built up and itself integrated.

Once more, a child of eight learned to talk within the normal period, but negligent and unconcerned parents allowed him "to come up any way." The result is, he has speech, but no language. He will not try to speak intelligibly and there is nobody to compel him to do so. None but his intimates can understand him.

These are samples of hundreds of illustrations that might be adduced. Doubtless others will occur to the reader.

It appears then: first, that every learning product of whatever type has in it, or has had at some time in its history, a volitional element; and, second, that whatever may be learned becomes effectual as a part of the fabric of personality, only in proportion as the volitional structure is maturing or has finally matured and become stabilized. Thus the first aspect of the integrating process. "

Instructional implications. It follows that it is folly to cultivate the delusion that children in the home and pupils in school should never be placed under restraint or compulsion. If they lived in a society so primitive that they would never learn anything that would not establish its own integrations, no harm would result. Judging from the tales of the early travelers, society

among most of the North American Indian tribes was at that stage and likewise the society found in the Pacific islands. At all events, we are told that among many of these, and peoples at similar stages of societal evolution, discipline of the children was all but unknown.

Dominance in rational structure

Intimately tied up with volitional structure, so intimately that it is difficult to separate them, is the dominance which functions in the structure of rational coherence — the thought structure.

We have in common speech a saying which holds that "one cannot eat his cake and have it too." In less figurative language, the principle is stated as the conviction that one's own acts have consequences beyond the control of desire. Any such conviction is part of the volitional structure, but it also implies a step in rational coherency. In general, there is little in rational action, or even in the thought processes upon which rational acts depend, which does not imply effort. The feeble-minded are incapable of rational activity, and consistently so. Thus far in our studies, we conclude that the reason is to be found in lack of general adaptive capacity. But normal people will act in much the fashion which is characteristic of the feeble-minded when volitional structure has not in fact passed beyond the infantile stage. Only they will not do so in naïve situations and they will not do so consistently, save in extreme cases. Intellectually, these people are "grown-up children." It follows that intelligence itself, the capacity to profit from experience, in a cultural situation, is founded in part on the volitional structure.

Now, rational coherency in the simpler and more uni-

versal forms of experience is undoubtedly organic, the basis of the elementary common-sense which the feeble-minded do not possess.¹ Things which refuse to go together in naïve experience, when they should go together, occasion distress. They do not make sense. In normal mentality, humans resolve the situation by coming to see why they do not go together. A new learning balances the old and the *person is governed accordingly*. The principle is interestingly illustrated in a perverse application by the occasional occurrence of hallucinations where there is no organic perceptual disorder. The requirements of rational coherency make hallucination more reasonable than reality. Perhaps most systematic delusions have a similar origin.

In childhood, incoherency causes no new learning, not because "children cannot reason," but because all the world is a world of desire. Equilibrium is restored by playing. Hearing that China is geographically under our feet, they will enthusiastically embark on a project of foreign travel by way of digging a hole. So far, action is reasonable enough in their ignorance. When progress leaves much to be explained, they play that the bottom of the hole is China and the dilemma is resolved. Any such behavior in adults, or even in older children, would be occasion for a commission *de lunatico inquirendo*, or in current terms a visit to the Bureau of Psychology.

Nevertheless, as soon as cultural learning is fairly under way and people have to live in a complex of major and minor institutions, many of them tend to do exactly what the children do: they will behave in obedience to desire outright even though they know their behavior to be utterly irrational. Distress inevitably ensues and they

¹ See the section on affective equilibrium in Chapter VI.

achieve equilibrium by a process which is badly named "rationalization." We used to say that "the wish was father to the thought" and we used to call the process of achieving spurious equilibrium "sour grapes." We shall encounter much the same principle of spurious equilibrium in inferiority compensation. At bottom such people are volitionally and rationally immature. Personality does not integrate and they remain weak.

The tales of people who have been lost in the woods are full of instances which illustrate failure in rational integration and resulting failure in control of behavior.

Here is a half-grown boy, familiar with the forest and with woodcraft, who observes that the afternoon sun is in the east. No matter, he proceeds on his way in defiance of the incoherency of the situation. Happily, he eventually comes out, several miles from the region which he intended to reach, to be sure, but safe.

An older man, who was personally no better developed than the boy, and in more dangerous circumstances, became panic-stricken and "went to pieces completely." Inadequate integration led under stress to disintegration of such personality as he had, and he "acted like a fool." In searching for lost men, experienced woodsmen came to realize that on catching sight of the victim they must approach carefully and often seize him forcibly. Otherwise, he would madly escape from his friends. "And the next summer we found his bones."

On the other hand, mature woodsmen, personally mature as well as mature in woodcraft, have told me that when they themselves became aware of the incoherency of a situation in which they found themselves — sun in an impossible part of the heavens, perhaps, or evidence of circling on the trail — they would sit down, bury their

faces in their hands, and wait for coherency to resume control. Mentally, they did not differ from their excitable friends; very possibly they were as high-strung in temperament; but they were personally mature in rational structure and were governed thereby. In them Reason would not desert her throne.

We sometimes hear people, who have yielded to desire and followed a course of action of which they are thoroughly ashamed, comfort themselves with the assertion, "I was just bound to do it." Rational immaturity, and incidentally an instance which illustrates the integrative effect of rational structure. Such people are undoubtedly often moral, if we can separate in thought the personal morality which is revealed; otherwise, they would not compensate their shame. But morality means nothing so long as they fail to be governed by the rational necessity of their acts. If the individual says, "I did wrong and am sorry for it," then there may be evidence of human frailty, but there is no evidence of rational immaturity.

In teaching high-school pupils, who has not seen them bring forward an irrational response to a particular piece of study, in mathematics or science, perhaps, when they were not only aware of its logical incoherency, but also aware that they would not "get by with it"? Or, as we have seen more than once, write a meaningless passage, meaningless to themselves even? These pupils are rationally immature in the presence of cultural situations. If the situation were a part of elementary common-sense, the pupils would not act that way unless they were either typically feeble-minded or else had become abnormal. Left at the stage of immaturity which we have described, they would never fully integrate, whatever their acquisition of insights and ideals. They would be properly

estimated as being *weak personalities* — cultivated, it may be, but weak.

Discipline. Here is where intellectual discipline enters. Immature children and young people will tend to behave irrationally in the presence of cultural situations unless they are prevented, for the reason that incoherency does not disturb them any more than it disturbs the very young child playing with his unreal world. Hence it is that constant admonition is required. "You know that your sentence does not make sense." "What would make sense?" "Write it." "You know that is unreasonable." "What would be reasonable?" "Do it again." And so on in a multitude of variations all the way up through school. The pupil normally requires it, just because he is still personally in pupilage.

Dominance in language and number

It will be recalled that we have seen language and symbolic capacity in general as part of the central integrating structure. There is, of course, such a close relationship to rational coherency that we shall not go very far wrong if we hold that capacity in language and in the management of mathematical concepts is part of the thought structure, so much that increasing command of expository discourse and increasing command of quantity and its relationships is in effect the maturing of the rational structure.¹

Distinction between rational maturity and logical thinking. Thus far we have dealt with the maturing of the primary rational structure, a process which has in it little of insight and much of that side of learning which we call appreciation, the taking-on of values.

¹ See striking comment in Dearborn, *Intelligence Tests*, 171.

There is, of course, another side to the thinking of the educated person, namely, that which comes from insight in the common logical processes or the laws of valid inductive and deductive reasoning. That requires specific learnings just as physics, chemistry, biology, economics, mathematics, require specific learnings. A person may be rationally mature and still customarily fall into the fallacy of reasoning that two events are in causal sequence because one has followed the other in time, unless he is specifically warned off by calling his attention to the common fallacy known as *post hoc ergo propter hoc*.

Spurious learnings. In other connections, we have several times met what we have designated "spurious learnings," learning adaptive responses instead of passing through adaptive changes. People who have come to be made up that way conduct themselves as civilized from fear of consequences or hope of reward; their tastes are the popular fashion of the moment; they exhibit all the outward symptoms of intelligence, but little of the inner light. Some of them seem to become so extensively spurious that they are hardly persons at all.

Now, if our reasoning is sound, these empty learnings are effect and not cause. They seem most often to be the consequence of early lack of discipline, either the discipline of experience or that of upbringing and instruction. The central dominance of the fabric in the volitional and thought structure does not develop. Hence, on the one hand, absurdities cause no distress, and on the other, the individual *will not* face a real world.

Mischance in early life, however, does sometimes so injure the self that abnormal defense reaction becomes structural. One of our cases, that of a high-school girl,

was a persistent lesson-learner in all the concerns of her youthful life. She was unhappy and was forever trying to "put herself across" by artificial means. Following the developmental history backward, there was disclosed a not uncommon family situation. An older brother was the pride of the family, and from our pupil's earliest days she had been aware that she was the child of less consequence. She tried desperately to make herself of consequence and of course she adopted artifices. In time her attitude became structural and pretty much her whole personal life apparently revolved about it.

In this girl, artificial inferiority compensation had led to a maladaptive structural attitude. Not so in cases where discipline has failed and the *get-by attitude* has become structural. However spurious may be this pupil's school learnings, the attitude itself is far from spurious. It is genuine and may easily take the place of the integrating center. In that event, we have the potentiality of the all-round criminal.

INTEGRATION OF THE SEVERAL STRUCTURES

Thus far we have been dealing with the integration of the fabric as a whole. What is true of personality as a whole is true of each of its several major aspects.

Volitional

There is no likelihood that there will develop an individual who can fairly be said to be a person of strong will unless he has developed in terms of the several volitioned learnings which we noted in the last chapter and very likely others as well.¹ Without them Will is merely an empty term. Stubbornness or other forms of negativism

¹ See page 264.

may doubtless be mistaken for Will, but these are not Will any more than are vigorous appetites and powerful muscles which enable the individual to have his way. Nevertheless, these several structural volitional learnings taken as an aggregate would not constitute Will-power any more than a heap of arms, legs, eyes, ears, a brain, heart, and all the rest of the bodily members and organs, would constitute a living body. These several learnings are accretions to a self which has consciousness, memory, and sundry physical and psychical means of contact with the world, and which acts as a whole. As one volitional learning after another emerges, contribution is made toward the strength of a personal self which in this respect is Will. The volitional structure is integrated.

Morals

Similarly, the structural moral learnings can hardly stand together as an aggregate of discrete entities. An individual may come to have a concern for the rights of others, but he is not likely to respect their rights if he has no regard for the sanctity of promises, and if his outlook on sex is that of the beast. Nor, on the other hand, is a sense of the sanctity of promises likely to be anything more than a defense mechanism if the individual has no appreciation of the rights of others. In the end, under right upbringing and right instruction, the moral structure integrates itself and we have what we call an "honest man," or woman. By implication, we do not develop honesty specifically in upbringing or in instruction; rather do we develop the learnings which integrate into honesty. To think of the term merely in its commercial aspect is to take a very superficial view.

Taste and intelligence

Again, when we speak of a "person of taste," we feel pretty sure that such a one will exhibit taste in all his or her cultural contacts and tact in social relations. We hardly expect one whose taste in literature is consistently good to prefer the music of the jungle or atrocious color schemes. Nevertheless, we have no good reason for thinking that taste in literature as such would carry over into taste in the choice of dress goods. The individual acquires taste in the several forms of cultural contact and the result is integrated, so much so that he or she is likely to exhibit tact, which is a form of taste, in the social amenities.

Finally, we rightly speak of a "person of intelligence" when his rational structure is coherent and mature, and when his outlook on all the major aspects of the world — physical, biological, economic, and civil — is that of understanding rather than passive acceptance or superstition. More than that, such a person senses what aspects of the world must be understood even though he does not understand them. He knows what is in essence an intellectual problem and what is not. He realizes that nobody has a right to an opinion on matters he knows nothing about; he distinguishes between science and politics. Granted maturity of the central rational structure, we may still get an individual who can scarcely be called educated if he still believes in the possibility of perpetual-motion machines, or feels that the doctrine of organic evolution is an affront, or has faith in the efficacy of economic messiahs, or thinks that apostrophes of democracy will secure justice and civil purity. There are doubtless several fields of intelligence, and one may be an expert in any one and still have no title to be called a per-

son of intelligence. Comprehension of life in the midst of an ordered universe as a whole is implied and the integration of many intelligences. Such a person is pre-eminently he who is capable of learning from experience.

Balance

All of our discussion of integration leads us to balance and its malady of imbalance.

Unhappily, it is too often true that the dominance in volitional and thought structure may be sound and yet the personality seriously defective by reason of disproportionate development of one of the major structures. This one is superb in taste, but primitive in intelligence; another is the opposite. A third is highly developed morally, but so devoid of intelligence that he is ethically an ascetic. A fourth has the tastes of the artist, but is morally a degenerate.

Such people always see the world in disproportionate emphasis. It should be remembered that these external adjustments, when they are genuine, constitute interests; and that interest is only another name for expansion of self. The unbalanced individual has taken part of the world into his family, but not the rest of it, and yet he has to meet the whole world daily. The educationally unbalanced tend to be failures more or less in what mental hygienists call the "solution of emotional problems." Socially, they are likely to be mischief-makers without knowing it, especially if they have contrived to get into positions of influence, and very often outright dependents. I suppose they are kindred to the highly specialized reptiles of the later Mesozoic.

Thus, the whole course of integration is the heart of general education and equally the heart of mental hy-

giene. We have no positive objective tests, so far as I know, which reveal the progress and extent of integration. We do have negative tests, for every diagnostic sign which reveals the presence of internal maladjustment and mental ill health is *prima facie* evidence of lack of integration, unless indeed it is known beforehand that there is present some defect in the adaptive organism itself.

But we can and often do recognize the well-integrated personalities in common experience of life. We call them "well-rounded," or conspicuous for "sanity," and say that "they stand on their own two feet." The last is likely to be literally as well as metaphorically true; they are well-poised. Such people usually show a history of not only firm and wise upbringing and well-rounded instruction, but, if men, are likely to have been under some form of systematic discipline, perhaps in the military service, perhaps on shipboard, perhaps in a strong school.

II

MATURITY

An individual reaches educational maturity when he can in fact be trusted to guide his own further development and when he has reached the stage at which he places right valuation on the relation of his self to other selves.

Deferred maturity

In general, all the evidence we can gather points to the principle that individuals who live in primitive society, or in a civilized society in which cultural accretions are not rapid, mature much earlier than do those who live in the midst of a rapidly accumulating culture. The

evidence is, of course, varied and voluminous, but it is all of the types of which the following are illustrations.

Among savages and barbarous peoples, the youth apparently matures personally soon after he is physically mature, albeit there is never in him any great wealth of personality; the cultural environment is not rich enough for that. As soon as he is strong enough to make his way in combat, and old enough to beget children, he is to all intents and purposes mature. At the corresponding stage, his sister begins to thrust the older women aside. To be sure, the old men and often the old women hold their place in council, for, while youth must be served, wisdom comes only with experience.

The early and middle periods of our national history yield striking instances of early maturity. Mere boys, we should say today, became effective leaders of commerce and industry, and they went to remote regions of the earth as captains of sailing ships. They matured early, partly because the common experience of life forced normal maturing of the volitional and rational structure. If your men would not work and would quarrel, you had to face the situation and conquer it; you could not escape into the arms of a committee. If your latitude and longitude were wrong, you were likely to get on the rocks; no explanations would save you. Furthermore, the systematic softening of personal fiber in the schools was still a generation or two off. On the other hand, they matured early, in part because there was not much to learn. The first part of Mr. Bowers's *Beveridge and the Progressive Era* seems to me to give an admirable picture of those times. In scattered fragments, that society survived until a period which is within the memory of men who are still living and active.

One of the most noteworthy illustrations is to be found in the history of the Civil War. The conduct of troops in the field and strategical conceptions of continental dimensions, during the last two years of the war, compelled the admiration of the professional soldiers of Europe. And yet even the general officers were incredibly young as compared with those who conducted operations in the Great War. Fighting came to an end in 1865, sixty-eight years prior to the writing of these pages, and yet there were veterans enough left to be active participants in the exercises of the last thirtieth of May. The rank and file were indeed mere boys.

Prolongation of infancy. Looking at the picture from another angle, increasing age at maturity is what we should expect as society grows more complex. One of the great generalizations of science is the doctrine of Prolongation of Infancy as a peculiar human characteristic and basic condition not only of personal but also of social development. Man has few if any native adjustments. He has to learn, and learning requires time. As society grows more complex, he has to learn more. Maturity is deferred.

Adjustment a factor in maturity

Now while there is no maturity apart from integration and while integration centers about the volitional and thought structure, which can mature early, it still remains true that in favorable cases the child integrates as fast as he learns the external world.

There comes to mind a case of progressive epilepsy. At the time the pupil came under our observation, although the malady was still in the *petit mal* stage, he had been excluded from the public schools. And yet the boy

could face his condition with equanimity. He was happy and he learned readily. His upbringing showed a history which it would be hard to match for firmness, parental love, and parental sanity. The central structure had matured fully as fast as the pupil's school learnings progressed.

More often, it would seem, we get the opposite kind of picture and the pupil learns the world faster than he integrates. His tastes are good and so are his morals. His outlook on the world is intellectual. But he is uncertain in behavior, unstable, alternating between self-assurance and lack of confidence, prone to pose.

Nevertheless, if the test of maturity be that which we have proposed, namely, capacity to guide one's own further development, it is manifest that the person cannot govern his own future development unless he knows enough to, unless, that is, his adjustment in intelligence, tastes, and morals has gone far enough to make him aware of the world.

Here is a pupil at senior-high-school level who not only chooses his career wisely, but is able to make use of professional information and advice as to his pursuits in the university. More than that, he is so far volitionally developed and integrated that he faces with equanimity his professor's admonition that he must learn to read certain scientific material in a foreign tongue — not to "take a course," but to learn by himself. A grown-up boy would rail bitterly at "the injustice" of the latter requirement. Our mature pupil is fit to be trusted in the university, in business, anywhere. And he will learn all his life long better than most folks.

Conversely, we frequently register students in a university, likely enough middle-aged men and women, who

look over the catalogue, select courses because the titles "read well," and ask for the first week's assignment. Such people may be beyond question as to volitional development and integration, but they do not know much. They are incapable of guiding their own development in the presence of Western civilization. When the world is going pretty well, they are carried along by the inertia of civilization. When one of the social cycles goes into a depression, they make endless mischief because they know no better.

The high-school pupil was mature, in part because he knew enough to choose rationally. He could choose a career because he could see himself doing what the career would require.

Here is an individual whose case appears in a guidance bureau. He has lost one job after another and admits that he was dismissed from the last because he defied his boss. What would he like to do? Well, he would like to write plays or do architecture. Being tested, he is thought to have talent, takes some courses in dramatic art and then *teaches* it, no less. He is happy through escape from the world; personally he is a mere collection of fragments, dilapidated, neither integrated nor adjusted.

Self-estimation

The notorious mark of immaturity is false estimate of self, or, to speak more accurately, unsublimated egoism. The infant is apt to be pretty nearly feral in this respect. He is an utter egoist, but under wise and firm upbringing he learns that there are other selves in the world. The small boys and girls in the vacant lot shout unblushingly, "Look at me!" "See me jump!" Altogether too much ego in the cosmos here. Eventually their exhibitionism

leads to clashes and perhaps combat, certainly to contemptuous comment.

Now, in due season the child's expanding interests remove concentration on self and there is decreasing occasion for the arrant exhibitionism of raw boyhood.

But let us suppose that very little genuine personality develops. What then? We have all of us seen what as we have contemplated the human comedy. Mark Twain's description of Tom Sawyer and the Sunday School Superintendent and the distinguished visitor is a case in point. Tom's behavior was the crude exhibitionism of boyhood, but the two men were showing off just as truly but with less puerility. And so were the young-lady teachers. I suppose few of us reach the point at which we are entirely free. If most of us do reach that point, it is a little hard to explain many of our ceremonials and the inordinate love of being dressed up in regalia of one sort or another.

Now protected from bullying or being bullied and left to work out their salvation, most children under the basal law of integration¹ gradually slough off extreme self-regard, give other interests a chance, and achieve the kind of sublimation under which self is justly appraised. In other words, it is very doubtful that any sort of sudden conversion is normally in the picture, or even any specific learning or learnings. Self-regard gets sublimated, not because the child learns better than continually to be attracting attention, but because other learnings and interests displace this primary interest of organic origin.

Nevertheless, an unfortunate infancy, contention between parents, unwise upbringing, temperamental peculiarities, bad companions, very often a bad relationship

¹ See page 292.

among siblings — any one of numerous mischances which make this far from being the best of all possible worlds — may interfere and produce a problem. To be sure, the child may be physically strong enough to become a bully. If that is not betimes knocked out of him, it will be likely to become structural and exclude other interests. In one of our cases, a boy had succeeded as a bully from an early point in the elementary school. He was always a learning problem, primarily because he could never become interested in anything but himself. Socially speaking, adults of that type, whether men or women, become veritable cancers in the body politic, super-egoists.

Repression

What is a good deal more likely to happen is that manifestations of self-love will be repressed — held back by the individual — while appetite itself remains unsublimated. The pupil yearns to attract attention, but that is unpopular.

This term "repression" requires comment. People who are saturated with half-digested notions taken from current psychology seem to think that repression is bad in itself. Hence the justification of "obey that impulse" and the doctrine that it is wicked to make children mind. A modern poet may carry the thing so far that a record of free associations is thought to constitute literature. Now repression is the starting-point of sublimation. Repression may be injurious when in fact no sublimation occurs, but, it should be recalled, nearly all forms of art and religion have grown up as channels through which sublimation can take place.

So mistaken are popular notions about repression that a distinguished American psychologist took occasion a

few years since to denounce them under the caption, "A Black Beast in Our Education."¹

Conceit. The result of repressed but unsublimated self-love may be intolerable conceit manifested in bearing, tone of voice, contemptuous remarks, and in many other ways. Snobbishness is seemingly a form of conceit. The individual desires attention, is averse to exhibitionism, and retreats into an attitude of superiority in the social scale. The individual no longer shows off, but we wish he would. Hopefully, the attitude wears off as personality expands and matures, but it sometimes becomes structural, as does bullying, and colors a whole life. Poor fellow! Who could ever convince him that he was conceited! Now it is a kittle point to distinguish between conceit and mere false estimates of *one's own powers* or *egotism*. The former seems to be the consequence of repression and as such colors personality; the latter is merely a case of bad judgment. Doubtless when conceit becomes structural, numerous minor learnings will represent false estimate of powers, so that the one leads to the other. Nevertheless, one sees obviously conceited people who appear to be actually lacking in confidence.

Unhappily, the individual is sometimes thrown into a situation in which false estimate of personal powers seems to be justified by popular adulation and an adaptation thus forms which amounts to a *delusion of grandeur*. But this is neither a product of repression nor necessarily a mark of immaturity. Indeed, it is apparently outside our discussion of self-esteem proper. It may occur at any age, much as other errors of judgment and the consequences thereof may occur. Naturally, it is more likely to occur in youth, partly because the occasion is more likely to

¹ G. M. Stratton in *Scientific Monthly* for December, 1929.

arise then — people are fond of extolling precocity — and partly because limited experience of life gives the individual no good basis for judgment.

Shyness. Or the repressed child — observe that I do not say “suppressed,” which is what other people do to him — may become dreadfully bashful and shy, and that amounts to a phobia. In adult life, the manifestations wear off, but it is doubtful that shyness ever wholly disappears or at least the consequences thereof. We do not know. Apparently, a great many lives are made permanently less than they might have been by reason of this maladaptation becoming structural and thus the determiner of a great many minor learnings in the fabric.

These are *maladies* of development. Others seem to be manifestations of *non-development* or *spurious development* or *under-development*.

Jealousy

Since long ago, strong men and women have recognized jealousy, or resentment at sharing with others an intimate privilege, as a mark of immaturity, so much so that they have attempted to “thrash it out” of the boy or girl. When they have done so literally, they have probably more often succeeded in establishing repression than in achieving their end. When their words have been metaphorical and meant only that they have compelled the youth to look himself in the face and consider the rights of others, they have no doubt accomplished something.

Cats and dogs are notoriously jealous. Young children are likely to be only less so. In normal maturity, the trait is displaced, not because the individual has learned not to be jealous, but because in the process of broadening appreciation there ceases to be any occasion. The con-

sistently jealous man or woman is to that extent infantile. It does not follow that the man or woman who resents the expropriation of actual rights is jealous; on the contrary, such people are to that extent personally strong and mature.

Inferiority compensation

Since Alfred Adler made the inferiority situation part of the body of scientific concepts, popular psychology has made much of what observant laymen used to call posing and strutting.

Adler himself seems to have been attracted to the consequences of organ inferiority, known to and felt by the victim. The inferiority is a chronic wounding of self-esteem, and the person tries to persuade himself and others that he is as other people and more too. He is constantly posing and therein achieves a spurious affective equilibrium. Posing is inferiority compensation. The mature individual does not pose; he accepts himself for what he is and is content. He is reconciled, in adjustment.

But there is manifestly more to it than sense of organ inferiority. Personal inferiority apparently acts the same way, especially in a society in which competition for recognized social position is not only part of the natural order of things, but is also artificially furthered by the whole framework of prevailing school management. The child feels inferior to this comrade who possesses strong muscles, or to this one who has more natural beauty, or to another who gets higher marks, or to a fourth who has a higher I.Q. Part of this is natural, inevitable, and to be overcome in the course of instruction. Part of it is artificial, needless, and to be eliminated as a needless obstacle.

So imperious is self-appetite that all this awareness of

inferiority is intolerable. The child will compensate if he can; that is, he will try to persuade himself that he is as good as others. Compensation is a natural process, even though it is sometimes mischievous. Sometimes it is positively useful. The boy who lacks the masculine quality of muscularity, and the girl who lacks the primitive feminine quality of beauty, will quite likely find compensation in scholarship, albeit this is far from saying that athletes and beauties cannot be good students. But where natural compensation of this sort is impossible, artificial compensation will be set up. The pupil who does not achieve good marks, or more substantial evidence of learning, is likely to adopt the pose that good learners are to be deprecated as being outside the pale. Cultivate the gentleman's grade! Many a boy who does not do well, either in school or on the playground, can at least become a roaring blade. His sister can become "daring" and "modern," not because she lacks modesty or desires to expose herself — one can see that well enough by looking at the result — but because she can attract attention that way. It has always been so, back to the Stone Age, I suppose. Both of them desire to stand well with the opposite sex, and "showing off before the women folks" is said to be the most ancient cause of war.

The immature adult runs in debt for a better car or better house than his neighbor owns, or he buys one with ready money. In a time of easy money, society swarms with vulgarians who one and all engage in a mad struggle to put on the symptoms of great wealth. So it was in Rome in the days of the *novi homines*. So it was in England when Germany and the United States had not yet caught up in the race for industrialization. So has it been over and over again in the United States. People

of common-sense say that these people are unaccustomed to wealth and cannot stand the pressure. So it is. More accurately, they had never matured. Consequently, they do not possess adequate adjustment or resources within and cannot adapt to the new sets of realities in which they find themselves. They compensate exactly as does the boy who gets himself into trouble with the police because he has failed of promotion from the fourth grade.

Now, as we have seen, compensation is a natural process and in principle far better than no equilibration at all. The mischief comes out of probable consequences at two points:

(a) The compensation may take the form of a real perverted attitude which becomes structural. The gentleman's-grade attitude is a good illustration. In adult life, it is found in contempt for "high brows" and "theorists."

(b) Compensatory *behavior* is prone to lead to experiences out of which perverse learnings or actual maladaptations may arise.

Failure in compensation

Nevertheless, failure in the compensations of childhood, and presumably failure in the maturing process itself, is of course even more disastrous. The result is apt to be the personal tangles which the psychiatrist encounters.

Psychoneurosis. In the first place, in individuals of unstable temperament, chronic failure in affective equilibration leads to neurosis and by that channel to serious physical ill health. Or the tortured organism may find an outlet in the delusions and hallucinations of insanity.

Envy and hatred and malice. In the second place, in people of more stable temperament, failure in compensa-

tion is very likely to lead into a singularly unfortunate maladaptation. When the immature self is obliged to admit superiority in another or others, envy tends to form and perhaps develops into hatred and malice. Here we have peril of serious social maladjustment and even in the end result senseless murder. Worse even than murder, worse because vastly more common, is interference with personal integration. None of us can carry about a load of hatreds founded on envy without becoming "mean," or more precisely getting utterly out of adjustment to the realities of social existence. Many a leader in social-betterment programs has sooner or later disclosed that the mainspring of his action was in fact envy of the successful and not altruism or sympathy for the unfortunate. Once in a place of power or wealth himself his earlier efforts come to look "impracticable." Envy had become structural and had perverted both actual external adjustment and integration; that is to say, it had led into self-deception.

Apart from the maladaptation which makes it difficult to treat other people decently, and which interferes with personal integration, the thing which we call envy has probably hindered progress in the diffusion of civilization as have few other acquired traits. The historical record is full of instances in which it has prevented public opinion from taking cognizance of and accepting patent social facts, even where the latter plainly pointed in the direction of the amelioration of the lot of the envious themselves.

Cultivating feeling of superiority

A characteristic of immature people can be seen in their tendency to seek situations which yield feelings of

superiority and avoid situations which yield feelings of inferiority. No doubt mature people feel a glow of satisfaction when they discover good evidence in themselves of actual superiority; but that is altogether different from hunting out situations for the sake of the feeling the latter may engender.

Here is a boy who plays baseball well for a time and is an enthusiastic supporter of the team. Sooner or later he plays ill and promptly lays aside the game. That is just boy, sensitive fellow it may be, but still just boy. Grown up to adult immaturity, he engages in nothing in which he is not a success from the first. Of course that means a handicap in life, perhaps a failure, if not outwardly, at least in personal integration.

This boy's physical director should be able to interpret the actual personal situation and convince the boy that, play well or play ill, play he must, and further that, although he may never be a first-class player, he can become a good player and that is enough.

We are all more or less familiar with this symptom of immaturity in dealing with immature persons in places of public authority. We say, quite correctly, that they are "trying on their authority." Most of us have unhappily had one or more such experiences with undisciplined policemen, or perhaps with some individuals whom the Federal Government sometimes places in receipt of customs. This tendency to cultivate feelings of superiority is probably at the bottom of most of the minor discourtesies and incivilities which make of life more or less a wrangle.

Cruelty. Within this class of the traits of immaturity is wanton cruelty, gloating over the sufferings of dumb animals and of other humans.

The prevalence of cruelty until very recent times was literally hideous. True enough, some of it, so far as infliction on dumb animals is concerned, was probably traceable to profound unawareness of the relations of brutes and men. That does not account for the fiendish cruelties of public executions and like episodes.

Abnormal psychology tells us that wanton cruelty is often a perversion of sex appetite. Be that as it may, the major part of the cruelty which we still see in life can be accounted for without calling upon sex. There is no good reason to doubt that the cruelty of small boys yields satisfaction because it makes them feel superior. Boylike they disclose their souls by boasting of what they have done. They commonly grow out of it. Some of them do not. Our elaborate list of individual and mob killings annually contains many cases which can most simply be interpreted as instances of feeding the lust of self-appetite in undisciplined and immature adults.

At maturity, this kind of gratification has disappeared. When we come upon a person who is apparently civilized and who nevertheless is on occasion found wantonly inflicting pain on his victims, we can be well assured that we are in the presence of a case of infantilism and that the apparently civilized character of his ordinary behavior is mostly spurious. It may sometimes be true that personality itself is in the main sound and mature and that the form of behavior in question represents a true instance of conditioned behavior.¹

On the other hand, we seem to encounter traces of this form of compensation long past maturity in persons who are for the most part genuine and estimable. These people find it hard to see other people wholly happy. If

¹ See page 97.

a friend is justifiably optimistic over a prospect, they go out of their way to draw a gloomy and unpromising outlook. These are they who love to assure us that we "must face the facts," even though the facts are and have been patent to all mankind since the beginning. They get a feeling of superiority that way — not that such is their conscious purpose. In all probability, love of killing wild animals is a similar vestigial remainder of the levels of immaturity.

The characteristic from time to time appears in society almost out of the blue. So it was in Rome in the gladiatorial combats and the tortures of the arena. So can one see suggestions of it in moving-picture scenes which depict physical suffering. Historians sometimes record the phenomena as evidences of degeneration. It does not necessarily follow. In all probability, in ages of widespread and rapidly increasing cultural facilities which minister to mere ease of life, the proportion of essential infantilism in the population increases. If social controls relax, these people are no longer kept down and the infantile trait reveals itself. Conversely, one of the reassuring symptoms of soundness in current society is the intolerance of callous and brutal treatment of animals which has lately found its way into the mores.

Negativism and defiance

In young children, negativism or resistance to suggestion is common. It apparently is a phenomenon of self-assertion found as a symptom of lack of obedience proper.¹ Miss Reynolds's study seems to suggest that it tends to wear off after the second year, but by no means always. One of my students reports a case in a little girl of five

¹ See page 246.

who on being told what day it was would invariably shake her head and similarly deny the validity of any truth declared to her.

In passing, we may note that such children exhibit lack of *docility*, teachableness, tractability, whatever may be their organic adaptive capacity.

Now, in older children, much the same trait appears as wanton defiance. Wearied, perhaps, by the unremitting suppressions of the Olympians, the pupil will now and then assert himself through some catastrophic act of misconduct. Anyhow, for the time being he squares himself with himself.

In young people we catch the same trait once more. Still inwardly unconfident, they compensate by defying everything — morality, decency, physical well-being, the statutes and the “existing order in society.” Sad to say, most youth movements, from the Children’s Crusade to our recurrent “present crises,” are probably illustrations of adolescent infantilism not essentially different from the baby’s “Won’t!”

Negativism in infants disappears as soon as the primary adaptation of true obedience is established, and that comes best out of consistent parental firmness. But, albeit this primary obedience is the basis of docility, the old Adam of egoism will tend to break out for a long time, as new channels for the manifestation of self-appetite open up and new authorities are encountered, and further as the bodily appetites mature. The individual under sane and consistent discipline is or should be mature in respect to this learning by the time he has finished high school at the latest.

The baby receives no positive support in his negativism, first, because he cannot read and, second, because

he cannot get about much. Not so with the pre-adolescent negativism and that of adolescence and even adult life. These spoiled children can read and they can get about. Demand creates supply. Books, newspapers, periodicals, and even whole systems of philosophy can be and are created to meet their desires. Few things are more welcome than to be told that we ought to do what we would like to do. Hence "defiance" is extolled and comes to be thought a virtue. I have more than once encountered adult objection to the doctrine of obedience on the naïve ground that, since George Washington led the revolt of the Colonies, we all of us ought to violate the laws and follow our own devices in moral living.

Adaptive inertia. In negativism we find what is probably the personal equivalent of adaptive inertia in the race, that resistance to change which entails extermination of the unfit as the price of progress. Within the domain of personality, it is always a factor making for *arrested development* in the individual and for degeneration in the mores. So it comes to pass that there is always a tendency for the younger generation to become arrested at the level of the adult primitives with whom they are in contact.

In the South, one can see how children of the whites are likely to be fascinated by the casual and improvident ways of the less civilized type of Negro. In the North, the town ne'er-do-well has always exercised an immense attraction for the sons of the thrifty. In the great cities, the gangster very easily becomes a folk hero.

Parkman makes it clear that the fur trade proved very alluring to the best stock in French Canada and that these traders would commonly revert to the social life of the Stone Age. J. T. Adams, in *Provincial Society*,

History of American Life, III, shows that the same thing happened among the Americans of the Middle Colonies, until the traders were typically the "dregs" and off-scourings of the Colonies. A favorite device is to explain these things as instances of biological degeneration. On the contrary, biological degenerates would experience a short life and far from a merry one on the frontier.

It follows that there is, and always has been, present in society, apart from strong families and strong schools, a tendency for a lower culture, representing a lower level of civilization, to drive out a higher when both levels can be found in the same community, for negativism tends to make each younger generation become arrested at the lower level. Here is the pathway of least resistance for the volitionally immature; here the appealing forms of life. So it was in republican Rome when the old Roman family began to fail and there was no school system to carry on. So it is in modern America. Music reverts toward the tom-tom stage; dancing becomes the muscle dance of the primitive; literature and the other arts tend toward the cults once found in degenerate Phœnicia; language tends toward the patois of the untutored and the argot of the underworld.

Acceptance of inferiority — Lack of confidence

The popular notion of the inferiority situation has attached to it the term "inferiority complex." Inferiority conflict is the better expression. The individual is not adequate, but he will not admit it to himself. Either he seeks a channel through which adequacy can be achieved — and likely enough thereby unbalances himself — or else he poses. The situation is the opposite of loss of confidence.

But the stream may take another course. Compensation and normal adaptation alike fail, and in place of envy there arises an acceptance of inferiority, a conviction of being inferior clay. Again, here is a maladaptive learning product and one of the most dangerous, for it easily becomes structural, and, worse still, tends to disintegrate the whole volitional structure. It is relatively easy to seize an indolent pupil who says "I can't," tell him that he can and must, and then see that he does. It is extremely difficult to make progress with a pupil whose word is, "I cannot because I know I am incapable." An incipient case of this sort can sometimes be dealt with by putting the pupil in a situation in which he is bound to succeed. Unhappily, the case may be of long standing and its origin in the long-forgotten blunders of a nagging parent or heedless teacher, psychologist, or physician. In that event, years of patient guidance may be required to replace the maladaptation with normal feeling of confidence. In a world which still persists in looking on all failures as the products of laziness, or else of congenital incapacity, such guidance is not likely to appear. Too many of us nourish feelings of superiority on the contemplation of the failures about us.

Immaturity in self-esteem an effect and not a cause

Now, throughout our study of this problem in its fundamentals, we are not dealing with learning products alone. People do not learn to be exhibitionists or jealous or cruel. These traits are the consequences of a powerful appetite which is organic and not personal, which is no doubt stronger in some people than in others, and which is the chief driving force in education. Nor do people unlearn these traits. They are sometimes obliged to

learn not to manifest them, and that in itself considered is apt to be mischievous. They outgrow them as personality matures and integrates and as the incidence of appetite thus sublimates.

On the other hand, such traits as conceit, shyness, envy, lack of confidence are learning products. They originate in the same organic processes as do other learning products including book learnings and they exhibit the characteristics of personal adaptation. They are maladaptations, but they are not spurious. They seem to arise chiefly as the consequence of repression where there is actually no subsequent sublimation.

Process

How, then, does self-esteem mature?

Let us bear in mind that both interest and meaning are probably phenomena of self-appetite. That is of interest which is felt to concern one; that has meaning in which the self finds satisfaction.

If the affective foundations are well laid in infancy, self expands normally, or at least tends to. The child becomes *interested* in parents, brothers, and sisters. Self expands to include the family and all that appertains thereto. In boyhood, the neighborhood fire-engine company or its equivalent, and then the home town, the baseball team, state, and ultimately my country, are incorporated in the self.

And so the circle widens. Self-esteem becomes milder because the pressure of interest gets distributed. There is less ego and more alter in the cosmos. Nevertheless, particularly in individuals in whom appetite is temperamentally strong, the person will still remain narrow and self-centered unless interest can expand over a good deal

more than any individual is likely to meet in direct experience. Hence, the cultural learnings, so be it they are genuine, which form the structural framework of civilization, tend powerfully to distribute interest, so that at maturity we find self-esteem at the balanced value which we are accustomed to see in those whom we recognize as cultivated people.

It follows that general education in which there is built up as personality the genuine value attitudes — morals, tastes, and volitions — genuine intelligence, and the essential capacities for expressing oneself and making contacts with the world, is in itself the maturing process under which self-appetite is sublimated and brought into balance.

It follows further that it is parental and pedagogical folly deliberately to impede the maturing process by cultivating self-love in the child, forever exposing him or her to the intoxication of adulation; or conversely by cultivating in him the sense of essential inferiority.

The former is often done. Sometimes no apparent harm results. More often sublimation is excluded and the individual goes through life encountering one insoluble emotional problem after another. Occasionally, an inevitable crime reveals the fact that a series of maladaptations and perversions had become structural. The youth in all sincerity believes himself superman and so far beyond others that he may even kill for the mere curiosity of the thing.

On the other hand, our highly competitive school and college system, with its spurious marks and grades, prizes, silly honor societies and snobbish clubs, imposes on the great majority of children and young people the needless task of constantly escaping from loss of confidence in

themselves. The crowning infamy is achieved when I.Q. lists are published.

Altruism. We must not confound sublimation of appetite with altruism, concern for the rights of others, nor indeed with the several learnings of the moral structure. These are adaptations which have an external, social import.

We may respect the rights of others, respect property, keep our word, because we prefer to do so. There may be a good deal of gratification in our acts, but that is another matter. In the mature individual, there seems to be no particular self-applause, in keeping a promise for instance; he would feel distress in doing otherwise.

Self-respect. In our study of the psychical aspect of the adaptive organism, we found that the self-less individual is a myth. We do encounter persons who seem to us almost perfectly unselfish. That, as we have seen, is another matter.

In the mature individual, appetite is as powerful as ever, just as bodily appetites are still strong; only it has become sublimated out of childish manifestations. In the place of "tetchiness," exhibitionism, endless posing, comes the dignity of manhood and womanhood, self-respect, honor. If the process could have gone to the point at which these too had become non-existent, the result would be personal nullity. Such apparently is the aspiration of some Oriental religions. But the process never does go to that extent, all the hagiographies to the contrary notwithstanding. Mere mortification of self runs easily into personal pathology.

Tests of maturity

Can we measure maturity? Assuredly not, although it is conceivable that scales can be devised which are capable

of giving some sort of measure of progress toward maturity in certain lines. Can we secure evidence touching its presence? In this chapter we have been identifying sundry marks of immaturity and seeing how it is and why they are marks. In the progress of a pupil through school we can observe his behavior and see the symptoms of immaturity disappear. We can draw conclusions. The latter have not the finality of exact science, but they represent valid judgment and they serve.

More specifically in the several school branches, the following are illustrations of valid observation and judgment:

(1) For example, here are notes of a visit in a junior-college class in English literature:

The pupils had prepared themselves by the critical reading of Galsworthy's *The Pigeon* and some of them at least had seen the play. Twelve pupils — nine boys and three girls. There was not a minute when the entire class was not attentive. Nine of the twelve were actually and genuinely participating. Save for the other three, the group manifested about the same maturity in discussion which one would find in a similar group of cultivated men and women.

We infer maturity here by a comparison of behavior with the behavior of persons of known maturity. We have valid evidence in the cases of the nine. We have no evidence either one way or the other in the cases of the three. If on subsequent occasions we secure consistent results — consistent but not necessarily uniform — we have a right to infer maturity, so far as literature is concerned, and the termination of general education in that direction.

(2) Again, here is a group of pupils in senior-high-school mathematics whom the teacher judges to be so far mature that they can be given an outline of the course

and trusted to master the principles without coming to class, save as they do so to satisfy their own needs. Some of them make good and some of them do not. The former would not succeed if their mathematical background were faulty, nor would they if they were not volitionally mature. On the evidence, the teacher rightly infers that they are mathematically mature. They can be trusted to go on with the higher pursuit of culture in mathematics the rest of their lives, if adult interests lead them that way.

The others do not make good, for after a little some of them come back to class and keep on with the others. Having tried their wings, they discover no confidence in themselves. Two of them treat the experiment as a happy release to the primrose path of the extra-curriculum. These are rounded up and restored to the straight highway of the educationally just. In this whole group, the teacher not only finds no evidence of maturity, but positive evidence of immaturity.

The phenomena can similarly be observed in the sciences and in fact in the entire content of the program of studies.

The pupil writes papers in many of his school subjects and he uses written and spoken language quite apart from his school work. Whenever he uses language, does he consistently employ the discourse which cultivated people employ, or does he use it only when on parade, or does he use it not at all? If the first, his use is one of the most comprehensive evidences of maturity, for it touches not only his external cultural adjustment, but the thought structure which is an essential part of the center of integration. If, on the other hand, his discourse is that of the schoolboy, and especially if it is consistently merely the argot which has seeped up from the primitive per-

sonality found in the underworld, then we have perhaps the best single bit of evidence that he is not mature.

How can one tell? What "objective measure" is there of cultivated discourse? That is a good deal like asking for a recipe by means of which the illiterate can estimate culture. It cannot be done. To be sure, the characteristics of good discourse can be so analyzed and formulated that a useful scale can be constructed which will standardize the judgments of competent observers. Even when that is done, the scale is not of much use save in the hands of people who know mature discourse when they see it or hear it.

(3) Similarly, the conduct of the maturing pupil in the group can be observed and the question raised, Does he consistently conduct himself like a mature, civilized individual and in such manner as to convince us that he can be trusted to act rightly, apart from hope of reward or fear of punishment? Not that he never lapses, but what is his consistent conduct? Remorse for occasional misconduct is as good evidence as positive good conduct.

Finally, maturity in self-appetite. As a matter of fact we are constantly estimating our neighbors in this respect. Our analysis of the phenomena of immaturity and of maladaptation gives us a working scheme by which the teacher who is himself mature can estimate his pupils. If the teacher himself is essentially immature, vanity will tend to make him refuse to recognize faults which are part of his own personality.

Maturity not perfection

Instruction would be hopeless if its goal were personal perfection. Perhaps the best single bit of evidence of

maturity in the self is ability to recognize one's own faults, willingness to look in the mirror.

It would be a sorry world, indeed, if the ripe wisdom and character of forty, fifty, or sixty were only what had been learned under the parental roof or in school. The essence of maturity is in the principle that the person can and will competently direct his own further development. The latter may be in the direction of specialized educational development. It may be in the higher pursuit of culture. In most cases, it will only be in finding the good life, living it, and learning from it.

There is an old adage which has it, "As the twig is bent, so will the tree be inclined." So be *inclined*, not *determined*. In building the structure of normal, civilized personality, parents and schools bend the twig and do what they can in this still incomplete world to guarantee that the learnings which accumulate in later life will be likely to be those which contribute to sanity, intelligence, refinement, righteousness.

III

MALADY

Few people, perhaps none at all, are in perfect bodily health. But most people are healthy within the limits of tolerance; we do not rate them as being ill until physical malady has gone so far that they suffer pain or are perhaps incapacitated for normal physiological living.

In our prolonged study of the fabric and integration of personality, we can hardly escape the conclusion that much the same is true of personality. There is this difference. The body, in the long trials of organic evolution, has become marvelously adjusted and integrated with respect to the functions which it is called upon to per-

form. The body is handed over to us by Nature, not altogether a perfect organism and not in every individual case even a good organism, but still one that will ordinarily accomplish wonders for a long time if it is not abused. Not so with personality. Whatever is built must be developed for better or worse within the years of childhood and youth. The individual may incorporate the sound personality of his race — that is to say, civilization — or he may not. He cannot help inheriting a body and usually a good body. He must acquire personality.

Nobody is perfect in personality any more than in body. Probably there are not nearly so many people who are personally sound as there are who are physically sound. Still, in civilized lands there are a great many people who are in the fullest sense personally sane and civilized.

The insane

On the other hand, there are some whom we recognize as being insane in some sort or degree. We do not any longer hesitate to think of these people as the victims of malady. That is our conception of them.

Now the unsound condition of these unfortunates is sometimes primarily physical in its nature. There is a lesion or some other injury or defect of a physical nature which prevents the normal or natural functioning of the adaptive organism.

It used to be held that all cases of insanity were wholly physical in origin, but the advance of psychopathology has clearly demonstrated that even some of the best-known forms can be purely personal without any defect in the organism whatever, either as origin or consequence. Indeed, they are sometimes even mentally as sound as

perfectly well people. The mental functions are unimpaired and even in the higher functions they seem sometimes to be uncommonly acute.¹ Perhaps their systematized delusions are successful compensations which in our terms have become structural.

More often, however, the malady starts life as an unfortunate personal adaptation, is never excluded by re-adaptation and becomes physical as well as personal. Nature abhors an unequilibrated affective condition, and if she cannot escape by an adaptive channel, she finds a way through a maladaptive outlet. Sometimes a pseudo-physical malady gets set up. There is nothing wrong with the organism, but the patient gets satisfaction in acting as if there were. These neurasthenias and hysterias give us some of the best evidence of the essential unity of the physical and psychical aspects of the organism and of the intimate connection between both and personality proper.

Malady in the normal

It is hard to see any essential difference in fundamental concept between the personal defects found in insanity described above and what we ordinarily term defects in character.

Such defects in part constitute failure in external adjustment. The individual does not get on well in the world and perhaps he becomes more or less a social problem in that he contributes less to the harmonious working of the fabric of society than he takes from it. But even more his defects constitute failure in internal adjustment. His thought processes in the complex of existence do not

¹ See, for instance, Harrington in *Journal of Nervous and Mental Diseases*, 54:193.

work straight, for he is constantly finding comfort in delusions about the world, wishful thinking, imputing to other persons and things the consequences of his own acts, prejudice; in brief, perverse rationalizations of desires based on his defects. On the other hand, conflicts within personality traceable to genuine ideals which are incompatible with sundry unsublimated inclinations mean chronic disequilibrium, which is commonly called unhappiness or lack of peace.

As we bring this particular aspect of our study to a close, it is perhaps well to remind ourselves finally of the intimate relation between external adjustment and integration. All along, the reader has perhaps been raising the question, Can there not be personal integration, perhaps complete integration, apart from adjustment to the external world? We have seen that in some cases the central structure develops and matures faster than external adjustment. In other words, the pupil's character develops faster than his knowledge. May it not be that some of our primitives — criminals, for instance — are splendidly integrated even on the basis of an utterly false adjustment? In the case of adults, I think not.

Adjustment implies adjustment to something. In the development of personality it is in the beginning as easy to adapt to the false as to the true, as easy to take on perverse or maladaptive learning as that which actually contributes to adjustment. Where can we find the test?

The answer is, I think, to be found in the principle that the individual is indefeasibly a part of society and the only valid common measure of life in society is civilization, itself a product of evolution, and the only definition we have of society as a fabric, just as the only definition

we have of an animal species, including the human species, is what it has come to be through variation, heredity, and survival.

And so it comes to pass that an individual who is obliged to live in society, unadjusted to the fabric which is society, is forced into continuous reintegration and perhaps finally into disintegration, much perhaps as meddling with the embryonic stages of one of the lower organisms produces a monster. If he is organically strong, especially in mere point of muscularity, in nimbleness of wit, in sound visceral organization, and living in the presence of a weak State, he is perhaps more likely to throw society out of civilization than to go through the process of disintegration himself. But even so, to say that he maintains personal integration is to do violence to terms. He is still intensely egoistic, for he has no interests which distribute egoism. He is cruel, and in the end analysis much of his career is explained by the interpretation which this form of superiority-hunting leads him to place on life. He is madly envious, and what is to others the grossest injustice is to him the only possible justice.¹ Nor need we have in mind merely the gangster of our cities. We find much the same type of personality in some people who never attract the attentions of the constabulary.

There is an old adage which advises us, "Be good and you will be happy, but you won't have so good a time." Very likely that is true, but at least it is admitted that happiness resides in personal integration.

¹ See Judge McAdoo in *Scientific Monthly* for May, 1927, in which the following statement is made: "The large majority of these fellows are lacking in the normal emotions of love, sympathy, kindness, gratitude, friendship and a sense of civic obligation, but on the contrary they are cruel, cowardly, heartless, selfish, ungrateful and I may add godless and dangerous, and above all they are determined that they will never do any honest, continuous work."

Two thousand years ago a Roman poet, himself an observer of men and affairs and decidedly not a Puritan nor yet a student of Freudian psychology, summed up the whole matter in a famous passage beloved of scholars for centuries, which Conington translates thus:

The man of firm and righteous will,
No rabble, clamorous for the wrong,
No tyrant's brow, whose frown may kill,
Can shake the strength that makes him strong:
Not winds, that chafe the sea they sway,
Nor Jove's right hand, with lightning red:
Should Nature's pillar'd frame give way,
That wreck would strike one fearless head.¹

By way of contrast, perhaps no more trenchant characterization of immature and unintegrated personality was ever written than that found in Henry Adams's estimate of Napoleon Bonaparte. Whether or not the judgment is historically a just one is another matter. As it stands, it is a picture of any individual possessed of a powerful organism and essentially uneducated.

Ambition that ground its head into every obstacle; restlessness that often defied common-sense; selfishness that eat like cancer into his reasoning faculties; energy such as had never before been combined with equal genius and resources; ignorance that would have amused a school-boy; and a moral sense which regarded truth and falsehood as equally useful modes of expression, an unprovoked war or secret assassination as equally natural forms of activity.²

¹ Horace: *Odes*, Book III, 3.

² *History of the United States During the Administration of Thomas Jefferson*, Book I, chapter XIII.

CHAPTER X

EDUCATION AS ADJUSTMENT

SCHOOLS and colleges are presumably carried on in the interest of education. Whatever may be the actuality of practices, nobody would frankly claim the contrary, unless he were lost in cynicism. What education in actuality is does not concern most school people very much and the half-million or more who sit on governing boards in the United States still less. No doubt most people take it for granted that education is going on so long as the schoolhouses are open and fairly well maintained and so long as teachers are on duty. Recurring to the thought of our first chapter, however, it is obvious that education is not likely to be the outcome, save by chance, unless instructional processes are governed by some defensible theory of education, or unless those who administer and teach are in possession of some awareness of the nature of what it is that they are presumably trying to bring about.

Now a great many schools in the aggregate are in fact governed by some sort of educational theory, so much so that their theories sometimes amount to veritable religions.

Others, probably the great majority, are governed either by tradition or else are not governed at all. If they are not governed at all, the outcome is sheer demonstrable chaos, for not only do they fail to transmit civilized personality, but, since their programs depend chiefly on the desires of pupils, parents, and teachers, they easily land in financial bankruptcy. Still, almost everybody has some theory which justifies or which he thinks justifies his practices.

I

Erudition or information

No doubt the theory which is, and always has been, most prevalent in actual practice is that which implicitly holds that knowledge and information are synonymous with education, that the more an individual knows in the sense of erudition the better educated he is. The view is reflected in most courses of study. It prevails in the ardent commercial exploitation of schools, in the interest, or supposed interest, of easy methods of imparting information.

Very likely the natural history of the idea goes back to the day when it was easily to be seen that the "learned"—chiefly clerics—were in actuality the only free men outside the nobility, and that there was a pathway to greatness along that line which the sons of the common folk could follow. Ideas persist, long after their meaning has disappeared, and to this day organized knowledge has very great prestige, indeed, despite the fact that we rarely elect an academician to be President.

Not a little pessimism regarding the possibility of education as a transforming and regenerating influence owes its origin to this mistaken view of what education is.

Unhappily, we sometimes find out-and-out rascals among men who have attained distinction in college. Education is therefore a delusion. Were not these men educated? Of course they are what they were born to be. So the argument runs. Those who can see in Man nothing more than a sort of organic machine find in such cases data for their theories.

Again, there have been numerous instances, especially among the conglomerate of races which make up the

British Empire, in which the sons of primitive races have been taken to the centers of European culture and "educated" — that is to say, they have been taught to read and write and have acquired a good deal of information — only to revert to the ways of their people on their return. Letourneau quotes such instances,¹ and they still turn up. Such individuals are commonly and rightly said to have acquired only a veneer of civilization. We can see well enough that, if they are willing to visit the centers of civilization at all, self-defense in the broadest sense will induce the acquisition of all sorts of adaptive responses. We frequently see the same phenomena in amusing ways in certain kinds of Negroes in the United States. Once more, it is argued that lower races are organically incapable of civilization.

The rascality and the reversion to type are alike evidence that education had not taken place. They are not evidence that the individuals were uneducable. They are, moreover, evidence that eruditional attainments in themselves are no proof of the presence of mature and adjusted personality. The erudite are, perhaps not infrequently, far from being educated persons.

In history. The confusion between education and the culture out of which education chiefly arises can be seen in nearly every historical work on the subject. Such works very commonly resolve themselves into histories of the changes in folkways and mores, of changing philosophical views in the erudite, and of the progress of cultural accumulation. They then typically turn, not to education, but to an account of the schools maintained by various peoples of the past and to a recital of the instructional theories which have from time to time emerged. They could

¹ *L'Éducation dans les Diverses Races Humaines*, 1898.

hardly do otherwise, for until within a very recent period secondary schools at least have existed chiefly for the imparting of information. The conspicuous exceptions are found in the schools of pre-Periclean Athens and in some of the earlier Renaissance schools. The court school of Vittorino da Feltre, for instance, in the first part of the fifteenth century, would not look so very strange as a good private school today. Vittorino seems to have had some title to rank as the first modern schoolmaster.

Education itself has nearly always been mostly the product of upbringing in the home rather than of instruction in the school.

In schools. Practically speaking, the eruditional theory as applied in schools signifies becoming informed about science instead of acquiring the insights upon which intelligence is founded; becoming familiar with literature and the products of the fine arts instead of taking on the tastes which ought to arise from these sources; being informed what one ought to believe and like in the place of conviction and preference themselves.

The theory retains its predominant influence largely by weight of tradition and partly, no doubt, as an expression of vested interest. If one qualifies himself to teach an academic subject in high school, it is hard for him to believe that his subject is anything else than in itself an integral part of education. More than that, granted the theory, it is easy for people to appear with new subjects which they would like to teach, on the ground that pupils "ought to know," and thus the program of studies expands indefinitely. If the high school can be held to instructional efficiency only by way of preparation for college, the professional interests of academicians will dominate the high school and be transmitted to the ele-

mentary school. If one has invested capital in enterprises set up for the production of apparatus designed to make the getting of information easy and school life entertaining, it is easy for him to believe that his wares are themselves an essential part of education.

Even so, all this is far better than the chaos of no guiding principle at all or of the theories which are purely mystical and fanciful in origin.

Confusion with university. Finally, the erudition theory as found in the schools is probably an outcome of historic confusion between the school and the university as social institutions, between the social function of general education and the more individualistic pursuit of professional ends or the higher pursuit of culture for its own sake.

And yet common-sense repudiates the whole eruditional theory when it finds in the common experience of life the inadequacy of people who are mere "walking encyclopedias" and doctrinarians. Common-sense is right.

In the first place, if we accept the dictum as being sensible and well founded that education is becoming the kind of person who knows what to do, knowledge is evidently a source of education rather than education itself.

In the second place, knowledge is the source of less than half of education. The more important and more fundamental sources are in the tastes, preferences, values, which come down to us in the fine arts, in religion, in examples of right and noble living.

And so we must dismiss the whole eruditional theory on the ground that it confuses some of the sources of education with education itself.

Speculative theories

Numerous texts which are commonly studied in teacher-training institutions classify under the caption "Philosophy of Education." Within this group can be found dissertations which range all the way from severe logical reasoning founded on the author's notions of the ideal society or State or Man downward to mere fancy which sounds well, and the latter is, of course, no philosophy at all.

Now the word "philosophy" started life as meaning very much the same thing as "science." Like such words as "education" and "democracy," however, it has been so bandied about in careless use that it has come to have almost any meaning that suits the user.

Sometimes one hears people say of a treatise in one of the social sciences, "I like the philosophy of the thing." On questioning such people it is easy to see that their notion usually is that a book which is made up of tabular exhibits and formulæ is scientific, while one which goes beyond that sort of thing and applies some sort of interpretation to the facts which it exhibits is philosophical. Well, that is much what the Greeks meant by "philosophia." In the understanding of these people, however, *The Origin of Species* would barely classify as science; while *The Wealth of Nations* and Judge Holmes's treatise on *The Common Law* would have no scientific standing whatever.

Most thoughtful people have some sort of philosophy of life; that is to say, they ponder over their experiences and observations and formulate to themselves more or less shrewd notions of how the world is put together. A great deal of fundamental common-sense is that kind of philosophy. The greater part of the liter-

ature of all races and all times dresses out this immense human attempt to put things where they belong. In fact, this great body of unformulated and unsystematic philosophy which is contained in literature is the source of much of the culture out of which the education of the individual is carried forward.

Most universities maintain departments of philosophy, and the departments are likely enough to include four branches: metaphysics, logic, ethics, and æsthetics. That is systematic or technical philosophy. These departments are cultivating scientific inquiry just as truly as are departments of physics. More than that, they occupy a field which no positive science can cover and which is as essential to straight thinking as that of any science. In truth, the world not infrequently gets into trouble because it forgets principles settled long ago by speculative philosophy. Periodic recrudescence of sophistry is even more disastrous in the practical concerns of life than unwillingness to accept the principle of organic evolution. Admittedly the methods of philosophy are not empirical, but then neither is mathematics empirical; and yet nobody would dare assert that mathematics is not a science. Nor are the methods experimental, but then neither are the methods of astronomy and geology strictly experimental; and yet nobody ever questions the scientific standing of these branches of inquiry.

The method of philosophy is in general *speculative*; that is to say, reasoning from the common experience of life and the necessities of logical coherence itself. The physical scientist uses the same method in formulating his hypotheses. The physicist, however, is in a position to test his hypothesis or theory by an appeal to experiment; that is to say, by ascertaining whether further facts

brought out under control are what they ought to be in the light of his theory. So in the end the physicist no less than the philosopher rests his case on reason. The philosopher, however, can gather no facts within his own field; he must test his theories in the light of facts elsewhere ascertained or else through a revaluation of the soundness of his reasoning.

Now speculative reasoning is good so long as logical coherency is the only test required. Thus has pretty much the whole structure of pure mathematics been built up. But mathematics deals with axioms, or self-evident truth, and employs marvelously unassailable methods of reasoning. So does philosophy operate in the field of logic. If A is equal to B and B is equal to C , then A must be equal to C . No question about that.

But whether or not A is equal to B is a question of fact, or empirical finding. Speculative procedure must pause in that kind of situation until facts can be found and principles can be inductively derived. The methods of philosophy are not applicable because there is no fulcrum upon which speculation can rest its lever.

For ages pretty much all intellectual attack on the problem of education was purely speculative in its nature and in general addressed to the issue, *What education ought to be*, rather than to the issue, *What education is*. The whole process of reasoning must of necessity revolve in thin air, for it had neither axiom nor principle nor facts upon which it could rest. Schools went on, not in terms of educational theory, an awareness of what it was they were trying to do, but in terms of empirical instruction. Indeed, comparatively few of the classical writers on educational theory ever had any theory of education. What they did formulate was often a theory of instruction,

which is not unlike skillfully fitting materials together without any notion whether the result is to be a house or a ship.

So all together there is no more place in the world for a speculative theory of education than there is for a speculative cosmology, anthropology, or physics.

Mysticism. Speculative educational theory very easily degenerates into sheer mysticism. It would not be difficult to fill a chapter with instances. One or two will serve as illustrations.

I once knew a mother who had experienced a bad attack of Froebelianism — this was a long time ago — to be much interested in a ball which she had hung over her baby's crib. This, she said, was to awaken in the infant's "dawning mind" the idea of completeness.

The other day, I was informed by a correspondent that children are all struggling to be free and that we ought to found our theory of education on frank recognition of that indubitable fact. Such notions are capable of being expanded into attractive poetic fancy and therein perhaps lies their charm.

And then we have all heard of creative education, which, if we retire from mysticism and get down to reality, means that we should induce children to re-create civilization without reference to the prejudices of perhaps fifty thousand years of social experience. We are not told whether the children would be likely to produce any better kind of world, or not. In fact, a characteristic of mysticism seems always to be reluctance of the mystics to "try it on the dog," as a precautionary measure.

Perhaps the most comprehensive and influential bit of mysticism now in common use is what is contained in the saying that education is not preparation for life, but life

itself. For some reason the statement sounds well. We might equally well say that eating is not a means of sustaining life, but life itself; that growth is not an approach to maturity, but maturity itself; that the origins of life are not origins, but life itself. Practically, as a guide of instruction, the notion leads to the conclusion that schools should be pleasant custodial homes and colleges country clubs. Now we have seen all along that the fundamental meaning of evolution itself is that of a preparatory process looking toward more abundant living. So right education, at least the education of childhood and youth, is of necessity nothing else than preparation for right living in adult life.

The theories coming under the head of "education for" this, that, or the other, so popular in teachers' convention addresses, are usually *illustrations of mysticism*.

The common characteristic of mysticism in all the ages is word worship. The word may be "abracadabra" or an appealing phrase which sounds as if it meant something.

We have no room for mysticism in our theory of education.

Individual-potentiality theory

For perhaps a century and a half a whole group of theories have had their day, and are still going strong, the common denominator of which is the notion of unfoldment of individual potentiality. The best exemplar is perhaps the early kindergarten and the spreading influence of that movement up through the schools and to a detectable extent into universities. With this view of education are associated some of the outstanding names in pedagogical history. A considerable part of modern

scientific investigation of educational problems rests in the last analysis on the assumption that the theory is well founded. The theory holds that each individual is in the beginning a complex of potentialities peculiar to himself, that education is a process of unfoldment of potentialities, and that instruction is therefore a process of finding the means which are best calculated to stimulate unfoldment and development. Granted the theory, it would follow that any such thing as a curriculum is meaningless and that each teacher must be left to himself or herself to find and apply the appropriate stimuli. It would further follow that each pupil either must follow the same teacher throughout his school days or else carry with him a case folder describing his unfoldment to date in meticulous and accurate detail. It would further follow that every teacher must possess practical insight beyond the dreams of science itself.

During the past century and a half or thereabouts, the theory has blossomed into a multitude of schools and programs of instruction and it seems still to be as fecund of its peculiar mysticisms and empirical ventures as ever. As an applied theory of instruction, it rests on the false notion of an analogy between the growth of a vegetable and the development of personality. Hence the child-garden idea. Historically it goes back to the theories of Man and of society which gave shape to the French Revolution, to the French notions of democracy rather than those which were the heritage of Anglo-Saxons, to the philosophy of Jean Jacques Rousseau.

Rousseau's anthropology, it will be recalled, rested on his conception of Man as a child of Nature, very much muddled and untidy as a consequence of living in a world of men and women who were similarly bedraggled. If

that be so, the best instruction is that which strips children of the habiliments of civilization, including clothing, and encourages them to develop their potentialities by expressing themselves. The instructor's task is then to suggest methods of self-expression when the spring of childish imagination runs dry.

Have we any basis for estimating the validity of the theory? I think we have.

In the first place, the ethnological facts are convincing. There never was a golden age, in a state of nature or otherwise. On the contrary, the more clearly we can read the story backward to what would presumably be a state of nature, the more clearly is revealed the reign of gross brutality and abiding dread of both the natural and the supernatural worlds. To hold that Man is a child of Nature, and then to build up a whole theory of education on that poetic fancy, is very different from coming to see that Man is part of the order of Nature and subject to natural law. Part of the acceptance of Rousseau's theories is no doubt traceable to humanitarian discontent with the teaching of some ecclesiastics expressed as the doctrine of total depravity. Religionists had a crude and singularly exasperating way of stating their case. Divesting their doctrine of such methods of statement as those which held that the infant was naturally an enemy of God, they were at bottom right.

Infants do not come into the world in a state of innocence and purity; they appear on the scene as organisms embodying certain inherent potentialities of physical growth and certain adaptive drives which we call appetites. Left to themselves, if that were possible, they would not grow up into adults living in a state of innocence and purity, but into savages or sub-savages.

In the second place, unfolding of individual potentialities goes back to exploded genetic and embryological theory, to the pre-formism which so captivated the naturalists of the seventeenth and eighteenth centuries.

Time was when it looked as if the individual was so far implicit in the egg that if you could get a microscope which was good enough you could see tucked away in the seed or the egg the plant or chick or child in miniature. Or, less crudely, that determiners could be found, at least in the fertilized egg, to account in detail for every personal as well as every physical trait. If that were true, then indeed was the individual infolded in the egg, if not exactly as homunculus, nevertheless as something equivalent to that. Bringing up a child was the same kind of process as cultivating a flowering plant.

Under these circumstances, all you could in logic do for any child was to get homunculus, or something like him, to unfold. True enough, he might unfold into an idiot or a criminal or a corrupt politician, as well as into a saint or a genius or just the common run of the mine. You could not do anything about it, except to catch your unfavorable prospects young enough and stop them unfolding. In that case, physical stigmata, such as the "criminal ear," would be a great help. Again, if you could find the earmarks of genius in the first grade, you would put the prospect in a class for gifted children and force the unfolding. Just how the teacher who had no pretensions to genius herself was to supply the appropriate culture for these queen bees was never, to my knowledge, revealed.

Now it is clearly in the evidence that the individual does not inherit *potentialities*; he inherits *adaptive capacity*. His adaptive capacity does not develop, save as a matter

of early organic ripening, nor has education anything to do with the development of organic capacity. If you expect to improve it, you must do that by stock breeding or else by medical intervention. The individual under education does not *unfold* his potentialities; he *uses* his capacity in learning.

Nor is even development *in utero* strictly a matter of unfoldment. On the contrary, like all organic development, it is a process of adjustment by adaptation. True enough, the direction of development depends primarily on the genetic material furnished by the parents and the species. An unfortunate pairing of genes, or a pairing of defective genes, may throw the dice in the direction of better or worse adaptive tendencies or in the direction of blocking any adaptive capacity whatever. Nevertheless, the interrelations of the cells themselves, or of the embryo and the mother's body, may likewise result in a normal and healthy or a crippled organism, or even a monster.¹

Altogether, then, the individual-potentiality theory rests on false anthropology and false biology.

Social implications of the theory. The theory has always been singularly welcome to those who aspire to reconstruct civilization on some different kind of model. It will be recalled that such was the hope of Rousseau and other men of his time. Disgusted and disheartened with the gross corruption, selfishness, brutality, of the Bourbon monarchy and the existing ecclesiastical organization, Rousseau thought that society, and not the State and the Church, was corrupt. Like many others, before and since, he erroneously conceived society to be thing-in-itself, in-

¹ See for instance Jennings, *Biological Basis of Human Nature*, especially chapter III. See also general principle of action, reaction and interaction, developed by Osborn in *Origin and Evolution of Life*.

stead of merely the name for a body of individuals living together in mutual relationships. Not so Jefferson, who was a member of the same group of thinkers in the next generation. Jefferson rightly put his finger on the heart of the trouble and gave the broad interpretation to the expedients of those who were founding the American State — and happily Marshall furnished the appropriate balancing device by determining the directions of our government and jurisprudence. Rousseau lived more than a century before the progress of science had reached the point at which society came to be seen as the product of evolution, subject to natural law, and subject to positive control. He was ignorant of primitive life and, like others of his time and later, entertained very romantic notions of the noble savage. Granting his premises, it followed that if the rising generation *en masse* could be restored to a state of nature, a new and purer "society" would emerge.

We now know that if his views could be made to prevail in logical entirety, the result would be that the tedious progress of many thousand years must begin all over again. On the other hand, if he could have achieved a modified instructional system in which children lived in a state of nature and were instructed at the same time, instruction must consist in imparting, not the ideals and intellectual achievements of paleolithic Man, but rather those of eighteenth-century Europe. Rousseau and his contemporaries were intellectually incapable of seeing that the very ideals in which their own disgust with the existing grafters and oppressors was rooted were themselves the product of evolution, ideals which had no existence in the "natural men" of their time.

Rousseau himself probably never entertained any no-

tion more fantastic and devoid of scientific foundation than that which we sometimes see in current educational writing and embodied in the precept, "We must not indoctrinate the rising generation." If that were sound principle, it would mean that we must not teach at all and that schools should be maintained only as custodial agencies. It is quite true that the teacher has no right to utilize his position for propagating ideas which are peculiar to himself, or his own particular coterie, or his own political party. That would be unwarranted indoctrination indeed.

The heart of the individual-potentialities fallacy, practically speaking, is contained in the false analogy to which we have already referred, namely, that personality develops as a vegetable or animal organism develops. We have abundantly seen that it does not, but rather that its development is by accretion, the accretions taking the form of new attitudes and abilities derived from the cultural capital of the race and not from the soil and the air, nor yet from the blood stream or the nervous system.

The doctrines of Rousseau, or rather the instructional theories of those who were influenced by him, and especially Pestalozzi, have been so influential in determining the thinking of school people who aspire to escape from the formalism into which school practices readily fall, that a digression and further analysis is perhaps justified. For this purpose, we can scarcely do better than to begin with a quotation from the historian, Monroe:

The latter criticism [passage from Rousseau] is as pertinent in regard to much of school work now as in the days of Rousseau. Geography is to be learned in the woods, fields, and hills, by the observation of the position of the sun and the

earth, by the study of the stream, the rain, and the changes of temperature; astronomy by the study of the heavenly bodies; botany by the study of plants; the necessary facts and fundamental principles of physics and chemistry by observation and experimentation; mathematics as it is needed in these other activities and in economic relations; history only through reading. Geography, history, and all subjects are to begin at home; only that which can be thoroughly comprehended should be attempted, and only that which is mastered should be passed over. "In general, never substitute the sign for the thing itself, save when it is impossible to show the thing; for the sign absorbs the attention of the child and makes him forget the thing represented." Most widely heralded educational discoveries or reforms of the present are but restatements or other attempts at realizing these principles formulated by Rousseau.¹

The statement contained in the last sentence is true. The spirit of the whole passage from Monroe is based on sound educational psychology, for nobody can learn that for which he has no ideational foundations. But let us see:

Here are certain schoolroom subjects enumerated: geography, astronomy, botany, physics and chemistry, history.

It is no doubt true that the pupil who has in his memory system no available images of streams, hills, woods, and rain, of sun, moon, and stars, of changes in temperature and means of measuring the same, could scarcely acquire geographical and astronomical intelligence. On the other hand, if he stopped with what is immediately available to experience, he would learn no geography or astronomy at all.

Astronomy by the study of the heavenly bodies, botany by the study of plants, physics and chemistry by observa-

¹ Paul Monroe, *Text-Book in the History of Education*, 571. By permission of The Macmillan Company, publishers.

tion and experimentation, appealing as these precepts sound, would in fact be to set the pupil to rediscover science.

Mathematics, as it is needed in these other activities and in economic relations, is to get the cart before the horse. At the higher levels, these things are comprehended in mathematical concepts and not the reverse. The precept is a good deal like deciding what arithmetic should be taught by inquiring what John Blank and his neighbors use. Blank *et al.* could commonly use more to advantage if they knew it.

History only by reading would be no history at all.

All subjects to begin at home suggests the query, What homes?

The passage is an admirable statement of the fundamental fallacy of this whole school of thinking. At bottom, it all means that the slate should be wiped clean and each generation of children be required to rediscover all that has slowly evolved in perhaps fifty thousand, maybe several hundred thousand, years of social experience.

Organic theories

Periodically a treatise or periodical article issues, the import of which is that education is a matter of habit-formation, or of the forming of associational bonds of one sort or another, or of the establishment of neural pathways, or the building-up of conditioned responses.

Now, even if learning itself could be interpreted in these terms — and a considerable body of critical material derived from the clinic and the laboratory, as we have seen, shows that far from all learning can so be interpreted — there would still be no theory of education derivable from the premises. The issues still remain un-

heeded. What habits? What neural bonds? What conditioned responses? Where shall we find a method of reasoning out the answer to "what"? The proponents are thrown back on the adjustment theory and upon organic and social evolution for their data. Just as eruditionists mistake the sources of education for education itself, so these writers mistake organic processes for the outcome of the processes.

Mental discipline

We finally come to a particular organic theory which, since John Locke's time especially, has influenced the curriculum, and indeed the whole theory of instruction, more than any other, save eruditionism alone. This theory held in substance that the content of studies or their practical utility is of small consequence as compared with the effect they have in "training the mind."

In its pure form, the theory set up a physiological analogy and claimed that by "exercising the mind" on subject matter that is hard enough, the same effect is secured as that which arises from exercising the muscles in the gymnasium. Hence, the theory was sometimes called the "gymnastic" theory. In fact, there has from Greek times down been a sort of fateful obsession touching similarities between the classroom and the gymnasium and athletic field, tempered by flights to the opposite extreme whenever ecclesiastics got control. Now, it was easy to be seen, or the disciplinists thought so, that it does not make much difference what kind of piece of gymnastic apparatus is used so long as it is a good exerciser. If you can only develop the muscles, the result will be good wherever muscularity is needed. Hence, reasoning by analogy, if you could find subjects which would exer-

cise the mind, the mind would function better in anything which requires mental effort, all the way from selling a bill of goods to acting as President of the United States. Certain subjects were thought to be particularly good exercisers. So it did not really matter if the Latin student, after four years of study in high school and a year in college, could not read his diploma; that was not what he studied Latin for. No compelling challenge was presented until the educational psychologists got fairly to work and then educational polemics became the order of the day.

The uncritical empiricists rushed to the defense.

Some of them said, "We are eminent men and we studied Latin. Therefore, the way to become eminent is to study Latin, and still better Greek. We ought to know."

Statisticians focused their formulæ on the issue and said, "Yes, that is so; there is a significant correlation between the study, of Latin perhaps, and the lists of names in *Who's Who*."

Some advocates went farther and refined the theory. History was good for training the memory, mathematics for training the reason, Greek and Latin for faculties in general. I recall a work, much prized by the embryo educational scientists of thirty years ago, which went the whole road and proposed to train sensation, perception, imagination, and so on. In fact, I have seen teachers at work with cases full of perfumes, essences, and the like, who called up the pupils individually and by platoons and bade them taste and smell for the sake of their senses. One teacher comes to mind who was going through some incomprehensible activity which, she said, "trained their imaginations." My own experience with healthy children had led me to suppose that it would be well to hold their imaginations in check.

The case of the disciplinists rested heavily on the faculty theory in psychology. Again a physiological analogy. Down until the emergence of laboratory psychology, the tendency was to treat what we now conceive to be *mental processes* as faculties, or organs in the similitude of brain, stomach, liver, and the like. Now, you certainly could train the muscles and visceral organs as well, or at least it looked that way. I once knew of a resolute old man who declared he would discipline his stomach into taking care of mince pie eaten at bedtime. At any rate, a good many of us have trained our stomachs to tolerate the effluvium of tobacco.

When the faculty theory itself, however, was shown to be untenable, those of the disciplinists who were rationally minded lost faith. Nevertheless, the empirically minded schoolmasters kept on until they were swamped and bewildered by a new enrollment. Under such conditions, the only recourse seemed to be to set up testing departments, and organize brass bands and basket-ball teams. Naturally enough, the professors of the academic subjects which stood to bear the brunt of the challenge stood their ground. The empirical case, as we have seen, was good, and it would be equally good today if the mores had not shifted away from the "gentleman's education," and for the further fact that a gentleman has small chance in the world anyway. The case for discipline based on critical and rational analysis of the disciplinist premises was never a good one.

Experimental investigation. But the laboratory psychologists devoted themselves to experimental investigation of the issue. Their method centered around what was called transfer of training. The investigators reasoned in this way:

If it is true that you can train the memory, for instance, then it ought to be possible after a period of improvement in memorizing nonsense syllables to find that ability to memorize something else — poetry, for instance — would be improved. The particular experiment was a favorite, but the whole range of mental processes, more or less, was covered.

In general, the studies from transfer were inconclusive as settling the question directly. The disclosures themselves sometimes went one way and sometimes diametrically the opposite way. Usually there was some transfer, often little or none, and sometimes transfer was almost complete. As so often happens in scientific investigation, the by-products were more important than the direct revelations. The inferences from the studies did go far to settle the main point at issue. On the whole, the studies weakened the disciplinist position.

At the end of the period of investigation, two interpretations emerged.

One of these, typified by the position of Thorndike, held to the doctrine of common elements and explained transfers on this ground. Training as acquired in the learning of Latin might have its effect on the learning of French, since learning is much the same in both, and so in varying degrees throughout the whole range of learnings.¹

The other, typified by the position of Judd, held in substance that there would always be the appearance of transfer when in effect there was something to transfer; that is to say, that if some particular learning had defi-

¹ E. L. Thorndike, *Principles of Teaching*, 1906, 248; same author, *Psychology of Learning*, 1913, 357 ff.; also, "Mental Discipline in High School Subjects," *Journal of Educational Psychology*, January and February, 1924.

nately been acquired, or, as he put it, generalized, it would function in all appropriate situations.¹

One school would hold, for instance, that the *process of learning* Latin would transfer and make easier the *process of learning* French. The other would hold that sundry *language learnings* acquired in the study of Latin are the same as those which also appear in French, which is, of course, philologically true. One school views learning as a process and inclines toward organic theories of education. The other views learning from the standpoint of product and inclines toward the evolutionary and adjustment theory of education.

The most illuminating and convincing single piece of experimentation and discussion which I have been able to find is that of Bagley.² In substance, Bagley's argument may be summarized thus:

Pupils can be trained to produce neat papers in arithmetic. They learn an adaptive response; one produces neat papers in arithmetic — only that and nothing more. Their learning demonstrably does not, however, automatically transfer to neat papers in other schoolroom subjects. Or they may be required to produce neat papers in all subjects and yet they are about as likely as ever to be slovenly in dress and in other forms of behavior. Nevertheless, if the ideal of neatness, or, as I have called it, "preference" or "appreciation," is established, then we find neatness as a personal characteristic.

Bagley's principle looked two ways. In one direction, it established experimentally, as I think, the meaning and significance of learning product, whereas most psychologists had been preoccupied with learning process. In the

¹ C. H. Judd, *Psychology of Secondary Education*, 1927, chapter xix; same author, *Psychological Review, Monograph Supplement*, no. 29, March, 1905.

² See W. C. Bagley, *The Educational Process*, 1905, chapter xiii.

other direction, it exposed the fallacy of generalized habits. We have already dealt with the substance of that issue, in our study of habits as learning products and have seen that personal adaptations are rarely, if ever, to be covered in under the rubric of habit.

The outcome of the whole period of studies of transfer went far to justify the adjustment theory. If what comes out of learning is generalizations or ideals and not mental improvement as such, then it is the same thing as saying that insights and ideals constitute essential learning products which contribute to education. On the other hand, some of the educational psychologists, and among them some of the most eminent, apparently still adhere to the doctrine of mind as a separable organ, as distinguished from the name applied to a particular group of adaptive processes, and that is the real heart of the disciplinist position. They overlook the distinction to be drawn between mental processes and the available content of the memory system. Upon the concept of mind as an organ hangs the whole doctrine of mental age and the whole apparatus devised for the purpose of sorting out humanity into beings all but divinely endowed, others hopelessly lost, and a great middle class predetermined from birth to bear the burdens of the world.

Loss. As a matter of instructional theory and current practice, it may well be doubted that more was gained than lost in the overthrow of the disciplinist position, theoretically false as the latter was.

In the first place, a good many writers, and a whole new generation of teachers, seemed to think that because the dogma of mental discipline had been proved false, all discipline was in bad odor. Of course nothing could be farther from the truth. Discipline in the sense of con-

straint is at the heart of the whole instructional process so long as adaptive inertia is an escapable factor in educational development.

In the second place, the subjects which were chiefly prized as instruments of mental training, notably Latin and mathematics, lent themselves readily to discipline in the proper intellectual sense. When they were taught well, there was little room for vagueness and uncertainty. More than that, the character of the material itself and a long pedagogical tradition made it comparatively easy to teach well. When an equation was solved, it was solved, and the process could be proved. When a sentence was construed, it was construed, and the purely logical import was clear. When the pupil did his work, he came to grips with reality and the subject matter lent itself easily to constraint on the part of the teacher. Intellectual discipline, as distinguished from mental training, was thus administered, at least so far as the subject itself was useful in cultural development. The process is far from being as easy in the physical sciences and still less in the social sciences. In these fields, a similar end can be achieved only by severe logical arrangement of subject matter for teaching purposes.¹

In the third place, thoroughgoing instruction in Latin was capable of yielding true learning products, or personal adaptations in the field of insights in the structure of language, and that is pretty nearly equivalent to instruction in the thinking process itself. True enough, the same end might more economically and effectively be attained through instruction in the vernacular, but it seldom was attained and in the end in large measure ceased

¹ See Science Type in the author's *Practice of Teaching in the Secondary School*, chapters xi-xvi.

even to be attempted. Meantime, the use of Latin as a language was almost never taught. Indeed, it is extremely doubtful that there is any occasion for such teaching in the field of general education. Similarly, good instruction in appropriate mathematical learnings puts the pupil in possession of what is without doubt the highest form of thinking; but to no good purpose unless he is required to use his mathematics in appropriate intellectual situations, and much of the mathematics taught is incapable of so being used.

Derivatives of formal discipline. Ideas persist even in the minds of those who renounce them. A cluster of guiding lights still burns bright in the philosophy of progressive leaders which are in reality the after-images of formal discipline. Some of the lights are: developing the power of individual initiative; of moral judgment; of creative imagination; of tolerance; and perhaps most of all developing the "inquiring mind."

Now, individual initiative is legitimately but another name for self-reliance and that is a characteristic of a well-developed volitional structure. Less happily, mere lawlessness and the willfulness of spoiled children can easily be mistaken for individual initiative.

One hears teachers admonished that "character education" often fails because children are given no opportunity for moral judgment. Judgment is thus looked upon as a faculty which requires exercise. Clearly, misconduct must be tolerated that children may get exercise for their "moral judgments." As well hold that pupils should be thrown into the midst of arithmetic and allowed to learn by making mistakes.

Creative, or better constructive, imagination is a natural mental process the vigor of which depends largely

on the pupil's temperament, upon the school learnings he has acquired, and seemingly most of all on his command of language.

Tolerance is a characteristic of well-rounded, balanced, and integrated personality in which culture has accrued sufficient to distribute the pressure of self-esteem, rather than a trait to be developed by exercise.

But the "inquiring mind" is perhaps the prime illustration of a fragment of the old doctrine which has drifted into strange locations. We recall that the most of the old disciplinists would argue that learning an ancient language for the use that could be made of it was quite aside from the question. The value in the study was the discipline that could be acquired that way. So the modern argues that studies are of little account and still less any learning that accrues from them, so be it that the inquiring mind is the outcome.

Now precisely what is there in the notion of the inquiring mind, save its sound?

Well, curiosity to begin with. But curiosity is organic, a matter of appetite and probably but one aspect of self-preservation and assertion. As such, it is assuredly not subject to training. It is the aspect of the adaptive system upon which to a large extent learning depends.

In the second place, interest. But, as we have seen, interest is but a name for a piece of learning after the latter has been incorporated and by reason of which the latter breeds more learning.

It follows that developing the inquiring mind is but carrying out a process of instruction which results in education. If we are indeed concerned about this quality, our natural course is to see that the pupil actually learns the things which are in truth comprehensive and signifi-

cant and learns them at times when they are within his accrued personal capacity.

II

THE SUM OF THE MATTER

The adjustment theory — preparation for right living

We have studied Man in the zoölogical series as the product of evolution and have seen evolution as a process of producing organisms which possess adjustment to a continuously broader and more complex environment until in Man appears an adaptive organism which implies the possibility of new entities in the universe, namely, what we know as human society and personality. So far as we can understand the world, the whole process appears to have been inevitable, the outcome of necessity so long as that thing which we call life exists. Indeed, scientists who deal with the inorganic world seem to find much the same thing going on in the stellar universe in the transformations of matter and energy. Apparently method remains the same throughout, while process goes from one phase into another. Method is at bottom the appearance of qualitative change as quantitative progress goes on and reaches one critical stage after another. With life, a qualitative change in the world, the process shifts to variation, transmission, and survival. With personality, another qualitative change, the process shifts to learning and the transmission of learning through cultural accumulation. It shifts away from progress by changes in the organism. But all the way along adjustment of some sort appears to be the fundamental law of life if not of all existence.

In our study of the adaptive organism and of personal-

ity, and in our attempts to distinguish between process and product, we have seen the individual taking on accretions to that product in adjustment which we call personality, each of them being an adaptation in the sense that personality is thereby modified into the capacity of getting on better in the presence of an ordered universe, and the individual in whom personality inheres into the capacity of contributing to the evolution of a society in which all can find peace and well-being; that is, of contributing to the spread of civilization. Peace and individual well-being are themselves definable on evolutionary grounds and in the end on the data of physiology and psychopathology. We cannot admit that the individual can define well-being on his own terms and according to his own fancy; well-being is objective and not subjective; the individual must find it. Remolding the world to meet the heart's desire would probably produce a world which the aspirants would not like.

It follows that the force of circumstances, which is and always has been the law, is inevitably always forcing the individual into conformity with the general trend of all evolution, sometimes with misery to himself and disaster to society, sometimes — always in the long run — with happiness to himself and hence to society. It is as ridiculous to suppose that we can invent education or society as it would be to suppose that we could invent a new and better body, or a better body of natural law. Through understanding the educational process and obeying the law there is every reason to suppose that we can devise instructional procedures which will mitigate, and conceivably in the end eliminate, the misery which is otherwise inseparable from adjustment by variation and survival. The instructional process has already accom-

plished a great deal in that direction by sheer trial-and-error.

It seems to follow that education itself is a process of adjustment by adaptation — that is to say, adjustment by inner personal changes each of them in the direction of adjustment; that right education is a process of becoming civilized; that civilization or the art of living together in the presence of natural law is inherent in the institutional products of social evolution; that right personal adaptations must be the elements of civilization.

The common-sense view. After all, in matters which affect everybody so closely as do growing up and finding a place in the world, the common experience of living gets reflected in common-sense views of education, some of which are singularly apt summarizations of the adjustment theory.

We hear people say of a troublesome child, "He knows no better." Such remarks have no reference to information or to knowledge in the academic sense of the word. What is meant is that the child is a child and there is implied the expectation that he will grow and eventually reach the stage at which he will have become better.

Similarly, in criticizing gross misbehavior of adults, we sometimes hear it said, "They are terribly ignorant creatures." Again, no eruditional lack is implied. What the speaker means is that such folk have not become adjusted to the expectations of civilized society. They have not become the kind of people who know "what's what." They are immature.

Once more, the criminal law recognizes the principle in its theory of responsibility, the presumption that the individual is aware of the consequences of his acts, not only the moral consequences but the logical consequences as

well. And so the law takes an attitude toward the wrongdoing of children, the feeble-minded, and the insane, different from that which it takes toward the acts of the normal and sane adult. It presumes that the adult knows that, if you sever the jugular vein, the victim will bleed to death; that, if you sprinkle kerosene about your neighbor's premises and touch a match to it, you know what you are about; and that you know that murder and arson are not merely contrary to law, but wrong in themselves. The law does not require that each of us pass an examination on his familiarity with the moral code or the elementary laws of nature; it presumes that sane adults have grown up into a sense of the quality of their acts. The principle is nothing else whatever than a statement of adjustment by adaptive change.

Finally, people whom we think of as being in the fullest sense educated are ordinarily perfectly clear in their self-dependence. They do not depend upon information as to what they ought to do in the ordinary occasions of life. They do not "look it up" nor do they "take a course." They have become the kind of persons who know what to do.

III

Such is Education defined in terms of adjustment.

Criticism

In one form or another most current writers who address themselves to the theory of education agree upon this view of the case. Even the adherents of mental training would in the last analysis contend that the application of their conception of discipline must result in an individual whose faculties are so sharpened and trained

that he could get along in any situation in which he might find himself placed. Wherever a theory rests on some form of individual unfoldment, however, it cannot be contended that adjustment is in the picture at all. On the contrary, adjustment is expressly eliminated in the contention that civilization ought to begin all over again in terms of the appetites and untutored curiosities of natural Man.

Changing society. The chief criticism of the adjustment theory rests on the indubitable fact that the fabric of society is and always has been constantly changing and on the further fact that in many respects peace and well-being do not exist for multitudes of individuals in what is sometimes called the present social order.

It is undoubtedly true that when the children who are now in school become adults the world will be different in many of its aspects from the world with which they are now familiar. So it has always been as the generations have grown to maturity. The movement is faster now, but not otherwise different.

On the other hand, if adjustment means becoming fitted to get along in the world as it is, it is unhappily true that the best instruction in some places would be that which fitted children to become gangsters, corrupt politicians, crooked business men.

But all this is to misconceive the nature of adjustment in its evolutionary meaning. Progress has meant not only the adjustment to a static environment which we find in the lowest forms of life, and adjustment to a changed environment, but, more and more, adjustment to an increasing range of environmental variations. It is quite true that the specialized forms have tended to perish because specialization meant adjustment to a static environ-

mental range, but the animals whose descent can be traced along the trunk line have on the whole been the least specialized or at least have kept out of the perils of overspecialization. So it is with the primates including Man. As compared with most of the existing orders, they are relatively primitive in general bodily structure and vastly superior in character and quality of the adaptive organism.

So it is with personality. If we recall our analysis of fabric and integration, we shall note that the adaptive changes which constitute the foundations have been in the world a long time, whereas acquiring adaptive responses to current needs constitutes no personality at all.

The pre-school learnings are as valuable in one place and one age as another. Reading is reading in its own time and place whether it be in English, French, German or in Sanscrit, Greek or Latin. Two and two make four in modern United States and ancient Peru. Water ran downhill in ancient Egypt and the laws of thermodynamics held good long ages before they were formulated. Geographical necessity produced much the same kind of villages and cities in the Hittite and Babylonian empires as the same kind of conditions produce in Iowa and Ohio. The tubercle bacillus can be depended upon to produce consumption under the right conditions equally in China and Canada. The supply-demand schedule tends to fix prices in a free society, as distinguished from communistic or manorial society, and always has done so. Universal sense of the sanctity of promises is a condition of social well-being everywhere.

So it is that the tastes and moral attitudes, the arts and insights which constitute the fabric of civilization likewise constitute the fabric of adjustment in one age as well as in

another. True enough, civilization itself does not constitute complete adjustment as yet. Man has not yet achieved all his escapes from all his perils, but he has made immense progress. Nevertheless, maladjustments which can be found in society today are to be attributed almost infinitely more to failure in the spread of civilization among the individuals who collectively make up society than to inadequacy in civilization itself. The best hope the world has consists in the increase in the number of individuals who are as highly civilized as are the most highly civilized today. From the beginning of time, so far as science can tell the story, the present has always grown out of the past and the future out of the present. The best that upbringing and instruction can do for the child, and for the society in which he must live, whatever form society may take, is to see to it that he catches up with the progress of the race. That is preparation and all the preparation there is. But it is enough, for out of it arises not only the social control of cultural change, but controlled adaptation to new conditions of living, even as the mature individual knows what is good for his further education.

Cultural change and civilization. A further criticism of the adjustment theory of education rests on the assumption of a rapidly changing civilization.

Now civilization changes but slowly. Nearly all that enters the structure of the art of living together in society today was present in the ancient world. Science in the last four centuries, and particularly in the last hundred years, has contributed heavily, it is true, but even so, scientific contributions to the attitudes of non-professional civilized man are not numerous. The chief contributions have been to the amelioration of the physical conditions

of life, that is to say, to culture. Courtesy and fair dealing are the same in the days of the automobile as in those of the horse-drawn vehicle. The radio as a means of communication would have been incredible to civilized Greeks and Romans, but after all the radio communicates nothing but language in some form and their languages were as effective instruments as ours. What is true of transportation as a means of cementing society was as true of the caravan routes of western Asia and of the grain trade between Ostia and Alexandria as of our transcontinental railroads and transoceanic steamship lines. The latter will cement a larger society and that is the heart of the matter.

If Cicero, perhaps as good an example of the best of ancient civilization as any, could rise from the dead and visit an American or English statesman and lawyer, the two would probably get on well together, ignoring language difficulties, much better indeed than either would get on with less civilized individuals of his own time and nation. The Roman would note changes in the institutions of property and marriage, but it is likely enough that he would recognize them as inevitable developments out of his own time. He would understand perfectly our systems of highways, but modern vehicles would probably be incomprehensible to him. Commerce and legal procedures and the State would be strange but understandable. He would probably recognize our difficulties with government as being similar to those with which he had to contend. On the other hand, one may suspect that the professional man of antiquity, Galen, for instance, would on the whole be more bewildered than the layman.

Quite otherwise is it with culture and cultural products. These increase and expand in bewildering array. They

incontinently force continuous change in the ways in which society is put together, and make the art of living together more difficult. But that is only to say that they require more widespread diffusion of civilization, especially in democratic states. They entail specialization, and specialization, apart from fundamental personal structure, exacts the same penalties as it has always done. But, given mature personality and enough of it in the population, cultural changes can be accepted or checked as social advantage may dictate.

Freedom and liberty. "But the child is struggling to be free." Quite true; as in all forms of life, adaptive inertia impels him to maintain the *status quo*, to resist growing up, to have his own way regardless of the consequences to others, in a word, to live outside civilization. The statement is equivalent to saying that the child is struggling to remain a primitive.

In our national conception of freedom we do not go beyond liberty under the law. We hate government by personal decree, but we do not hate government itself. We achieve liberty when we escape from the embrace of domineering individuals into the arms of competent government and settled law and order, when we feel that justice will be done us whether we are pleased by the decisions of the umpire or not. Freedom takes flight when government can no longer protect us from the attack of the primitive and our property from the unrestrained extortions of the tax-gatherer. But encouraging the child in his kind of struggle to be free leads precisely to that form of tyranny and loss of civil freedom. Granted the successful application of any such theory of education, the result must be that only the physically strong and mentally alert could achieve freedom. All others must

suffer the consequences which flow from the unrestrained gratification of appetite on the part of the powerful.

So much for civil liberty. But not even the powerful could in that way achieve personal freedom, for we are under the control of natural law to a far greater extent than we are, or need be, under the control of civil law. Nobody is free who is the sport of uncomprehended circumstances, who lives in dread of the unknown, who cannot accept and rise superior to the slings and arrows of outrageous fortune and to the inevitable march of destiny in the loss of that which he holds dear. Nor can anybody be free who, without resources within himself in his arts and memories, is forever dependent on external stimulation for the maintenance of personal vitality. But the individual is free who does have resources within himself, who knows what to do without being told, who understands natural law in the social no less than in the physical world and can govern himself accordingly, who can distinguish between the evitable and the inevitable and equally refuse to accept the one and be able to be at peace in the presence of the other. But all this is only to describe the only kind of individual freedom there is in the world, ever has been, or ever will be. It is only to restate the nature of mature and integrated personality and to redefine education in terms of its outcome. And yet no individual lives or ever has lived who could achieve freedom apart from the process of learning what the race has learned in the long process of social experimentation. Progress consists in achieving this sort of freedom for more and more of the individuals who make up society.

Now those who believe themselves to be liberal educationists have commonly held in abhorrence, not only the adjustment theory, but also the theory that erudition and

education are synonymous and the theory of mental discipline as well. These notions of education seem to them to have a tendency to stand in the way of the liberty of the individual. Their fallacy evidently consists in the principle that they mistake hedonistic pursuits for happiness and in the last analysis cultivate the ancient sophism which held that Man is the measure of all things instead of being, as we know him to be, part of the order of Nature and conditioned by natural law.

Individual and social well-being. There is nothing in the adjustment theory, or in any other theory of education, which guarantees individual well-being in either the economic or civil sense. The fully civilized man or woman is the product of upbringing and instruction and we undoubtedly have many such, particularly in the Western nations. But the fact that any one of them may have achieved civilization does not warrant him or her a place in the economic scheme or protect him from personal violence or save him from spoliation of property. It undoubtedly does on the whole assure him or her of a better *chance* for a place in the world and a better *chance* for protection. But in the end the chief outcome is a more intelligent life, larger resources within, better capacity to combat the evil in the world, better capacity to face the world whatever his lot may be.

The principle has particular pertinence at the period in which these chapters are being written. The enrollment in high school and college is in large part there because the young people hope to secure places in the economic world that way; that is to say, to get jobs, specifically "white-collar" jobs. Most of them are bound to be disappointed, since there are not enough of their kinds of jobs to go round. They place a false value

on education and such false value tends to prevent them from acquiring education in any true sense at all. In short, the individual can secure advantage only out of the spread of civilization throughout society.

The social import is quite otherwise. The things that still hurt in society, crime, civic corruption, economic displacement, injustice, are one and all the consequence of ignorance, vice and selfishness among the individuals who constitute society, and not defects in civilization or in the State itself.

If the majority of voters in a democratic state are so ignorant of the functions of government and so lacking in civic intelligence and character that they can be swayed by the demagogue and by corrupt politicians, crime and injustice, governmental incompetency and fiscal bankruptcy will be the inevitable consequence, and it often is. The civilized minority cannot escape the consequences, for they must live in the same society as the primitives.

If the masses are sunk in barbarism, then in a democratic society the mores will become barbaric in character and the rising generation must tend to adhere to the views and customs of barbarism rather than to those of their civilized parents.¹ Civilized people will be deprived of the music and drama, the literature and religion which give them satisfaction and will be confronted at every turn with experiences which are repugnant to all civilization.

If the rising generation as a whole fails to mature in respect to volition and fundamental morality, then they will be catered to by degenerate writers and artists who praise defiance and immorality, and help the infantile to find compensatory defense for their inadequacy. The social outcome will be that respect for justice, for the

¹ See page 322.

rights of property, for the marriage relation, for the sanctity of promises, for willing obedience to constituted authority, will disappear out of the mores. Society is held together in all its aspects by these qualities far more than by government.

Critical importance of the school. There is nothing new about the foregoing argument. Three centuries and more have elapsed since thinkers and statesmen began to see that the only agency calculated to lead to social well-being in the new national states is the national school system. The Church might do it, but the Church was breaking up into a multitude of churches. The Home might do it, but that is to get the cart before the horse. In a closely knit social fabric, the homes of any one generation will depend upon what the schools of the preceding generation have produced. The State has never been able to control the Home; it is always possible for the State to control a school system.

And so national school systems spread throughout the civilized nations. Nevertheless, a school system is not education; it is only the administrator of public instruction. Public instruction or any other kind of instruction fails to serve any useful purpose unless it transmits to the masses the essentials of civilized life.

Individual initiative. The only other criticism of the adjustment theory, and indeed of any systematic instruction whatever, rests on the fear that it will either destroy individual initiative or else give it no chance to develop.

Now individual initiative, as we have seen, is either the manifestation of impulse, in response to appetite in some form, or else it is the product of intelligence acquired as a body of insights plus volitional development. We have dealt at length with people who "have to be told,"

with recipe hunters and their like, and have seen good reason to believe that they are typically "lesson-learners," adaptive response learners, spurious personalities, or at least personalities who are trying to function at a level at which they are not adjusted. Education in the sense of having become the kind of persons who know what to do has not in them consummated. On the other hand, a great deal of failure in the capacity of initiative is no doubt traceable, not to incomplete personality, but rather to perverted personality, to the presence of dreads of one sort or another which have crept into personality and have become structural.

The first kind of individual initiative is evidently mere lawlessness. The second form is that which is characteristic of disciplined, educated personality. The latter is perhaps as often or more often revealed in self-restraint, refusal to rush blindly in where angels fear to tread, as in forthputting and vigorous action where such is required by circumstances.

We occasionally find devices proposed for "training individual initiative." In so far as such imply refusal of parent or teacher to do for the child or youth what he ought to do for himself, they are properly to be understood as procedure in upbringing or instruction calculated to overcome indolence or adaptive inertia and to force the immature person into experience out of which can arise learnings of a volitional character. Ordinarily, however, aspirations for training individual initiative are survivals of the formal discipline dogma and faculty psychology and as such they assuredly will never be more than aspirations.

In all probability, American worship of initiative is a survival from our frontier period and a phase of our

lingering worship of success in the rise to affluence and fame of men and women who started from humble beginnings. There is immense solace to self-love in the contemplation of individuals, apparently no different from ourselves, who make the front page as captains of industry, military heroes, movie actors, even Presidents. As a consequence, the "go-getter" is our hero. Very few of us are go-getters ourselves but these people encourage us to believe that we are and we like it. This kind of success has always been easy in America, for no nation in the world has ever combined the variety and extent of our resources in a defensible area with the lack of restraint assured to the individual by our political and social institutions. What we forget is the fact that our go-getters have involved us in long series of needless financial and general economic disasters; and that, down to 1917 at least, in every war we have ever fought the forthputting individuals who served as generals in the early phases led our civilian soldiers into shocking catastrophes and needless slaughter — largely because they possessed more initiative than intelligence and self-restraint. We require but one President every eight years — sometimes every four years — but at present we need some forty million intelligent and conscientious voters all the time. The principle as thus stated will stand equally well for commerce and industry, for science and art, for living under civilization in general.

Irrelevance of the criticisms. But after all the criticisms are irrelevant, for one and all they are based on notions of what the critics conceive that education ought to be rather than on the evidence as to what education is. They are opportunistic and sentimental rather than scientific and positive.

Social implications

The notion that instruction, and particularly instruction supported and carried on by the State, has a social import is probably as old as the idea of bringing up children, and certainly as old as the school. Nevertheless, it is, and always has been, constantly overlooked by schoolmasters, and theorists as well. Whenever the notion re-emerges, its proponents are wont to think that they have made a new discovery and they are likely to be carried away on the shoulders of their own conversion.

Now thoughtful men in all the ages have seen clearly enough that no State can ever be organized which will in itself hold society together and make possible the maximum distribution of justice and well-being. Government in the last analysis is either the expression of the will of a despot or of a majority, or else it is the expression of a body of institutions found in the convictions and customs of the body politic itself. In the first alternative, the outcome is tyranny, whether the government be in the despot or the majority, and chaos as soon as the despot falls or the majority disintegrates. In the alternative, the State abides only as the institutions on which it rests are transmitted from generation to generation, and it progresses only as the institutions themselves are refined under enlightenment. In popular governments, both stability and progress depend in the first instance on the diffusion of civilized personality among the masses of the people who constitute the body politic.

Vast progress has been made in the only direction which is worth while, namely in the distribution of justice and well-being, but only because homes and schools have on the whole been more effective than ineffective. Otherwise, there would have been no progress at all. Un-

happily, however, progress is and always has been halting. At times, there is partial recrudescence of barbarism, and two or three times in the history of the last six thousand years, civilization has been lost for centuries, over wide areas. The recovery in such cases is extremely slow.

Now progress is halting, just because schools and school systems are at times incapable of transmitting civilization. That is especially true when States have indulged in reckless expansion of the electoral franchise, without any corresponding strengthening of their school systems.

In general there have been three ways, in theory at least, of deliberately applying public instruction to social ends.

You can utilize your schools primarily for the purpose of propagating the doctrines of a religious sect or the plans of a despotic government. A variant is the propagation of the world plans of an economic Messiah who is thought to have invented a "new social order." No education is, however, involved.

Or you can retire into a faith in innate morality and intellectual potentialities and hope literally to reform society by seeking the purity of pristine man. In that case, you pin your faith to the reliability of appetite as a guide to social regeneration and individual enlightenment. It is a risky business at best, but perhaps that is the best way; a good many people have thought so. The difficulty resides in the principle that the premises are demonstrably false.

Or finally you can ascertain what the course of social evolution has been and the outcome of social experimentation and the conditions under which people lead a sane existence. In that case, you lose confidence in schemes which have been invented for the regeneration of society

You eschew notions of education for this, that or the other. You can find no meaning even in the precept that you must educate for social ends, for you come to see that right education is right education and that since people's most exacting environmental pressures are social in character any possible right education is in itself the taking on of the art of living in society, adjustment, not to the community, be it local or national, in which the pupil lives, but to the conditions of civilized existence.

Such is the social implication of the adjustment theory and that is the course which schools on the whole have followed, despite many mistaken notions as to the effective content of the curriculum and as to the requirements of systematic teaching.

Practically, most progress is made in the direction of the essential ends of all organized society, when a nation is controlled by civilized persons, be they few or many, not primarily in the interest of the people who happen to be living at the time, but rather in the interest of truth and reality, justice, the survival of universal standards of morality, decency and good taste, and of the arts which yield the higher satisfactions.

The curriculum

If the adjustment theory be sound, and it appears to be incontestable, then such notions as elective systems in the schools, or differentiated curriculums are essentially fallacious. The individual must come into adjustment to the world and not the world to the individual. The pupil must learn to read, write and cipher, whether he will or no, whether he has bents in these directions or not. These are necessary adjustments, essential parts in the

structure of civilization. The same argument holds good throughout the curriculum of general education.

Pupil programs and teaching. On the other hand, the adjustment theory with equal clarity implies an instructional procedure which is as flexible and experimental as the adaptive requirements of individual pupils dictate.

If the art of reading is the curriculum objective, then the problem arises of finding out how to teach every pupil to read, and not of switching him into some subject which he learns more readily. The latter is seldom done in the case of reading; it is frequently done beyond the primary school. This one may require a body of reading material quite different from that which his comrade can profitably follow. Another may exhibit mental or temperamental peculiarities which require modification of the classroom technique which is appropriate to the class group as a whole. What is true of reading is equally true of every other objective which has any place in the curriculum of general education.

On the other hand, under theories based on the notion of unfoldment of individual potentialities, any curriculum at all is an absurdity, for each pupil must of necessity be a law unto himself.

IV

HOW DO PEOPLE GET EDUCATED?

How, then, does education in the individual come about?

Our whole study thus far has been a body of evidence tending to show that education in the individual, provided the individual is an adequate adaptive organism, is as inevitable as evolution in the race. Each step is a learning which arises out of experience. It follows that any individual who possesses an organism through which

experience can register, and who has experience, will go through an educational process of some sort. But experience is only less likely to be perverse than to be good, much as for every useful variation in the evolutionary series many thousands have occurred which were either useless or positively in the direction of maladjustment. Hence education uncontrolled by sound principles of instruction is not likely to lead to the adjustments which have occurred in the process of social evolution save by chance, and reliance upon chance is enormously wasteful.

The heart of the matter is, then, *What learnings*, and *How shall experience* be arranged so that the desirable learnings will most certainly and economically arise? The answer to the first gives us our Theory of the Curriculum. The answer to the second gives our Theory of Teaching and of Discipline. The two combined constitute our Theory of Instruction. We are primarily interested in the first.

What learnings?

The adjustment theory once established leads us assuredly to the groundwork of our theory of the curriculum. If we keep within the confines of evolutionary doctrine and avoid the pitfalls of sheer empiricism on the one hand and speculative fancy on the other, the curriculum for general education in the individual can be nothing else than the products of social evolution which have accrued in the long process of trial and error out of which the art of living together in society has been built up. In other words, the individual climbs the ladder of civilization and stands on the shoulders of those who have gone before. That is the only kind of adjustment which we know anything about.

Adhering to empirical venture — that is to say, to trying this or that to see if it works — leads into indefinite experimentation, which in reality is no experimentation since it rests on no reasonable hypothesis. Even if it could be done, each such experiment would require at least thirty years. Indeed our whole school history has in large measure been a story of curricular empiricism, of continuous unregulated changes. Who ever heard of a new high-school principal, superintendent of schools, or college president who did not conceive it to be his first duty to revise the course of study?

Following the pathway of speculative fancy, on the other hand, we finally arrive in a land of educational goblins and hobgoblins.

To inquire into the structure of civilization, at least in so far as to find elements which can rationally be made the structure of the curriculum of general education is a formidable undertaking to which we shall address ourselves in the second part of our study. We shall stipulate to ourselves, however, that the inquiry proceed without prejudice as to what we find and particularly without preconceptions as to time allowances based on the traditional school system. If we find that general education for all classes of the population, as we have defined general education, is a practical impossibility, even that will not disturb us.

READING REFERENCES

If the student would have before him a concise summary of what educational theories have stood behind school practices in the past, he will perhaps find the most available treatise in English to be:

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CHAPTER XI

EDUCABILITY

HAVING found a defensible answer to the query, What in fact is education? we are under logical obligation to get some light on the question, Who is educable? Are all members of our species educable in the sense of possessing capacity to take on the essentials of civilization as they are found in the products of societal evolution? Or are most of them educable? Or are only a few? Manifestly, it is folly to maintain schools for the masses if only a few of them are capable of profiting from the schools, and it is equally manifest that if such be the case the democratic State is a mischievous delusion.

For nearly three quarters of a century, the issue has been one of the major preoccupations of social and biological science, and scientists are still diligently at work on the problem. A great deal has been made out by those who address themselves directly to the question, and perhaps even more can be inferred from the discoveries of scientific studies which have primarily been concerned with other matters. It would be absurd, however, to say that the last word on the issue has been pronounced. We can at least endeavor to get our thinking straight and come to some conclusions along general lines as to what has and what has not been made out. We shall of course have in mind our findings touching adaptive capacity proper as they have appeared in our study of the adaptive organism.

I

THE BURDEN OF PROOF

Our point of departure, then, is based on the issue, Where does the burden of proof rest? Is the argument bound to show that in fact some people *are not* educable and that others are educable only in part; or is it bound to show that some or all people *are* educable? In other words, must we assume that all are uneducable save as some are shown to be educable, or that all are educable save as some are shown to be the contrary? The issue is not an open question; few issues anywhere in modern science are open questions, save in unexplored territory. The burden of proof is nearly always on the investigator to show that existing reasonable assumptions are wrong, and why and wherein they are wrong, as a logical precedent to showing that something else is right.

Now, in the humanistic sciences particularly, scarcely any question is an open one, for nearly all of them rest on matters of ethics, which appear not at all in the physical and biological sciences. They all tend to rest ultimately upon the inviolability of the individual, which has been perhaps the primary assumption of western nations for the past twenty-five centuries at least, and especially since the advent of Christianity. Thus our law assumes the innocence of an accused person. He is not obliged to prove himself guiltless; the government must prove him guilty. We refuse to tolerate the use of human beings for experimental purposes without their consent. To most of us it seems horrible to contemplate experiments on society at the hands of people who happen to have seized the reins of power, especially when they arbitrarily deprive humans of life and liberty in the interest of their

schemes. Great innovations in medical treatment have seldom been used until the physiological effects were demonstrated by trying out the treatment on lower animals.

In our present inquiry, that the burden of proof rests upon those who would prove that individuals or classes of individuals are uneducable is hardly to be doubted. Otherwise, we ought to close our schools, at any rate until we know who is educable.

There is, moreover, a special logical obligation resting on schoolmasters and teachers, which applies less pointedly to the psychological investigator. The former have a selfish interest in proving individuals who fail under their instructional procedures to be incapable; otherwise blame attaches to the instructor. Bias is inescapable.

The requirements of the logical situation, all through the recent period, have tended to be ignored. The result has been that the merely plausible has often been accepted as proof, particularly when the facts upon which plausibility rests have been refined by highly ingenious and laborious investigational technique. The case on this point is particularly clear in respect to the inferences drawn from intelligence tests and from the assumed influence, or lack of influence, of the environment.

Confusing adaptive response with adaptive change

One of our cardinal theses in this volume is that discrimination must constantly be made between adaptive response and adaptive change, that is to say, between overt act and the fundamental change in personality upon which overt act may be based.

We have seen that adaptive responses are made in profusion when in fact there is little or no personality upon

which they can be founded and indeed no learning of any kind. This is true of the whole domain of impulse.¹

Again, adaptive responses are learned quite apart from any actual change in personality and thus arises one of our fundamental instructional problems.²

Finally, when personality has itself been built up, outward behavior consists of adaptive responses. For example, one must keep an appointment in a distant city. He uses a railway map and a timetable and thus plans and finally accomplishes his trip. Selecting his train, taking a cab to the station, purchasing a ticket, boarding the train, dismounting at his destination, reaching his hotel — all these are adaptive responses founded on a variety of minor learning products in the fabric of personality. The minor learnings themselves center about major learnings, chiefly in geography and arithmetic and in central volitional structure.

Now in the case of the illustration just used, it is conceivable that of two individuals one may be nimble-witted and the other dull. In all behavior that is founded on unlearned adaptive response the former will rightly appear to be superior in adaptive capacity. And yet the dull person may plan and execute the journey with accuracy and facility whereas the other may prove altogether helpless. The difference is in the principle that one knows and the other does not know, one has become the kind of person who can plan journeys of this sort and the other has not. To that extent, one has become educated, and the other has not. Nevertheless, if we attempted to infer *educability* from the respective adaptive responses in this particular situation we should grossly underestimate the educability of the quick-witted individual.

¹ See page 163.

² See page 107.

Conversely, if all reliable and intimate psychological tests revealed superior capacity in adaptive response, what we commonly call quick wit, it would not necessarily follow that the quick-witted person was the more educable, that is to say, the more capable of taking on adaptive changes in personality. If the tests could go to the extent of estimating not only the acuteness of the mental functions proper, but also appetitive pattern, and general pattern of the physiological functions, then we might perhaps legitimately form an estimate of relative educability from clinical disclosures.

But practically all tests upon which inferences as to educability have thus far been grounded are in one form or another measures of adaptive response.

In our worship of genius so called, we are very much inclined to indulge in what is at bottom the same fallacy. We infer that outstanding statesmen, military men, artists and scientists, captains of industry are superior clay, whereas all we have any right to conclude is that they have become in one way or another more adequate personalities. One of the conspicuous examples of such is said to have called genius "infinite capacity for taking pains" — and he had to learn to take pains.

Post hoc ergo propter hoc

A very large proportion of the argument touching educability thus proceeds from the collection of facts touching the issue, Who has been educated, and especially from facts derived from relative success in school. Now it is comparatively easy for skillful makers of tests to derive instruments which will predict with a high degree of reliability probable success in school. Resting then on the assumption that success in school is a measure of educabil-

ity, the inference is drawn that the tests are themselves measures of educability.

Instructional failure no criterion. Noting that the assumption that success in school is in proportion to educability is so nearly an obvious fallacy as to be scarcely worth arguing, but nevertheless accepting it for the moment for the sake of argument, it still remains true that reasoning that an individual who has failed in school must be uneducable is an example of the elementary fallacy of *post hoc ergo propter hoc*. It does not follow that because the instructional process has failed in the case of an individual or a group that therefore no instructional process and no teacher could succeed. Nor does it follow that, because no instruction of which we have at present any knowledge can possibly succeed with a given individual, the latter is therefore uneducable. We have made some progress in accomplishing what would once have seemed impossible; we have no reason to suppose that we shall not continue to make progress.

Equal chance. Perhaps the commonest expression of the fallacy is found in what may be called the doctrine of equal chance. . It is held that when, of a hundred children perhaps who have had exactly the same schooling, ninety-nine succeed and one fails, the failure must be due to incapacity inherent in the organism of the unfortunate one. It may indeed be so, but the inference does not follow from the premises. The actuality of equal chance is well-nigh indeterminable. Conditions over which the school has no control, in the home, in the neighborhood, are constantly operating to prevent any such thing as equality of experience which tends to determine learning, in the cultural and personal sense of learning. But granting for the moment the contention that experience can be

equated, it is still patent that, *apart from the most diligent systematic instruction*, learning even then has an inescapable tendency to go wrong, that is to say, pervert, with the result that the fabric of personality is more or less distorted and subsequent learnings go awry accordingly. Errors in attitude toward learning and in the learning products themselves, especially in the primary-school reading, writing and number, creep in, go unnoted and perhaps are never disclosed, save through a fortunate application of good case study in later years.

But equality of conditions under which pupils learn in school never are equated. The child comes to school with the fundamentals of personality already established, for better or worse. This pupil may have lived for four, or it may be six, pre-school years in good bodily health and in a home in which he has been protected from the rise of phobias and all the denizens of the kingdom of personal evils. Another, outwardly indistinguishable from the first, may still bring with him to school the foundations of a personality which is more or less a tangle of adaptive and maladaptive pre-school learnings. A third may be free from all these and yet be negativistic and otherwise arrested in personal development by reason of negligent upbringing.

Retarding influence of primitive homes. A variant of the argument from success in school is the argument from quality of the home. The argument is more plausible, for in the home there is also the genetic succession in family line. "What can you expect from that kind of home?" is reasonable enough; apart from systematic interference you cannot expect much from primitive or degenerate homes. The characteristic fallacy with which we are dealing enters when such expressions as "poor

stock," "slum people," "white trash," "niggers," "polacks," "hunkies," "shanties" are added, for there is likely to be implied organic inferiority inferred from the fact that educated personality arises with difficulty out of such homes. True enough there may be in such families or neighborhoods inferior stock, but that is a fact to be determined. Inferiority in the stock cannot be inferred from primitiveness in the home. Again, this is to argue educability from the fact of education or the lack of it.

Now in all the most highly civilized nations there is still a more or less extensive substratum of homes which in truth rise not much above the level of prehistoric man. In countries in which the social fabric is loosely knit, as it is in the United States, there are likely to be many of them, because they are not controlled. In countries in which there is a powerful "blue-blood" tradition there are likely to be more of them, because they are controlled and ignored.

We have seen how powerful is the influence of the home by reason of the fact that therein is the dominant force of family affection. The cultural patterns of the home get established and the best that the best schools can do is to modify; they can seldom replace.

More than that, the homes of the primitives become more or less isolated in communities of their own, partly because interracial conflict forces it, partly because people are happier that way, partly because political and economic power is thus consolidated. Whether it be in organic or in societal and cultural evolution, isolation is the parent of types, races, species.

Thus it comes to pass that the chief positive influence making for common, civilized standards, the public school system, operates but slowly. As the graduates of

the schools go back into the body politic, they carry with them personality modified out of their racial tradition but modified only in part. They tend in the long run to make somewhat better homes and in the process of upbringing to pass on a somewhat better cultural background. In three or four generations, a civilized standard may be achieved which is indistinguishable from that supposed to be appropriate only to people endowed with superior organisms. From the truant officer to the state university in three generations is common enough but not the rule.

Now, contemplating the successful lawyer or physician, or the cultivated lady or gentleman, whose grandparents or great-grandparents began the American career as illiterate peasants in the waiting-room at Ellis Island, or maybe slaves on a Georgia plantation, the convinced born-in-the-blood advocate says, "Must be throw-backs to some gentle mesalliance." He begs the question to prove a theory — and very likely allows his sons and daughters to revert to the primitive cultural stage from which the civilized descendants of primitive homes have arisen.

We cannot admit then that valid conclusions as to educability based on findings as to who is educated and especially those based on success in school, can ever be sound. When tests are devised which predict success in school and then the same tests are used for comparative studies of educability, and by inference, of organic adaptive capacity, then the whole body of scientific study resting on the tests is involved in the fundamental fallacy which attaches to the tests themselves. When they are used for the purpose of determining what individuals are and what ones are not educable, then a monstrous violation of our fundamental ethics seems to be perpetrated.

Organism, environment and systematic instruction

An age-old debate touches the educational attainments of the individual as centered around the old lyceum issue, Heredity vs. Environment. In a broader and more exact sense, the issue is, Which is the determinative: the quality of the adaptive organism or the influence of environmental circumstance? Or in recent terms, Nature or nurture?

Now we ought to be able to discriminate more exactly than do any of the issues above-named, for we have seen with some degree of clarity the distinction to be drawn between the processes of the organism as a biological instrument and the outcome of its functionings in cultural products — products like monuments, buildings, paintings, books, records of all sorts which remain as tangible and visible parts of the environment; and products like insights, tastes, and moral attitudes which are invisible and intangible but none the less real and transmissible as culture from generation to generation.

Nature. We are convinced that like breeds like. Within certain limits, that is of course true. There is more likelihood that a child born of physically sound and healthy parents will himself be organically sound and healthy, than there is that one born of feeble and neurotic parents will be a thoroughly normal specimen. More than that, a child born in a family which has been prudent and self-denying in its matings for several generations stands a greatly enhanced chance in the world. But even so, there is nothing more than a likelihood. Human beings are not thoroughbreds, but mongrels. They are not specialized but generalized. From the earliest times, exogamous rather than endogamous matings have been the rule. A pupil who is now in high school probably has sixty-four lineal ancestors who were living at the time of

our War for Independence, and very possibly one hundred and twenty-eight. Each one of them was the product of outbred miscellaneous matings. The chances against any particular isolated genetic trait, and more especially any particular combination of traits, appearing in a given individual are very small indeed, save as the trait in question is common in the population.

But biological transmission in the germ plasm is not the only determining factor in the quality of the adaptive organism. As we have seen, developmental circumstances *in utero* and after birth may profoundly modify the organism as an adaptive instrument, quite apart from any taint in the genetic material. The mother's general health, the influence of alcoholism, syphilitic and other infections, mechanical accidents during gestation, are examples of mischance before birth. Disease, mechanical injury, malnutrition are examples of what may happen after birth. From the educational standpoint, it is on first analysis immaterial whether a given organism is inadequate by reason of germinal taint or as the consequence of developmental injury. The essential point is in the fact that the organism is inadequate or inferior as an adaptive instrument whatever the cause may have been.

Environment. Now about the only positive evidence we have touching the relative weight of hereditary and environmental influences in educational development comes from studies of identical twins, or twins which have arisen from the same fertilized egg.¹ The biological heredity must be the same for both individuals and the chances that there have been unequal influences *in utero*

¹ See H. H. Newman, "The Effect of Hereditary and Environmental Differences upon Human Personality as Revealed by Studies of Twins," *American Naturalist*, May-June, 1933.

are at least small as compared with children produced at different births. As to unequal physiological influences after birth, the findings cannot be positive save in the presence of refined and accurate case histories. Nevertheless, in the absence of evidence to the contrary, it is fair to assume that no important impairment of the respective organisms after birth has taken place.

In such cases, the qualities of the organisms of the two individuals have been fairly well equated. When the children have been separated after birth and brought up in two different families, the environmental influence is the variable. The investigational technique requires infinite patience, not only because the task of establishing identity is exacting, but because the investigator must wait for his cases to turn up. More than that, before the study can pronounce on the *extent* of environmental influence, we must wait for a fortunate instance in which the environment of one of a pair has been at the worst and of the other at the best.

The results to date show clearly enough that such environmental influences do in fact have a marked effect in determining personality in all its aspects, that is to say, upon the education of the individual.

However, we are not so much concerned with the method and the results of the inquiry as we are with the distinction to be drawn between the casual influence of the environment and the influence of systematic instruction.

Systematic instruction. Studies which deal with nature-vs.-nature questions, and perhaps more often the readers of the studies, are prone to reason in this way: Studies show that environment has some influence on education, but comparatively little as compared with original nature

(quality of adaptive organism). Education (what is meant is teaching, instruction, schooling) is an environmental influence. Therefore, education can have some influence, but original nature must always remain dominant; at best it is perhaps a fifty-fifty matter.

Now suppose we picture to ourselves the more favorable family environment in one of a pair of Professor Newman's twins. The effect of the environment is clear. But suppose the foster parents in such a case, or natural parents as the case may be, to be the kind of people who are well versed in the principles of upbringing, qualified to detect and remove unfavorable educational tendencies, and further qualified to bring to bear positive instructional procedures: is it not reasonable to assume that comparative studies of the pair would in that case show greatly more marked differences than appear when only the casual influences of a better environment are in the picture.

But we need not stop with mere supposition. Fortunately we have a classic case in evidence, that of Helen Keller.

Helen was a child in whom the organism had been grievously injured after birth by disease in infancy. She was deaf, blind and dumb. Her intelligent parents sought and secured in the services of Miss Sullivan the competency which goes with genuine professional education. Under the casual influence of a good home, the child by the age of seven had laid the foundations of a warped and wayward personality; this was natural enough, since the organism had still the normal appetitive drives, temperamental pattern, and affective apparatus, while the absence of the two fundamental distance receptors prevented the maturing of speech and effectively

excluded her from society. Nevertheless, Miss Sullivan saw her case as an instructional problem to be solved and not as an opportunity for traditional routine. She thought it out in terms of specific objectives, in terms of suitable procedure, and in terms of experiment. In an incredibly short space of time, she had found her way into the child's consciousness by other than the normal pathways and education began to take shape under instruction. It was necessary to use symbolic media devised for the purpose, namely symbolism built up about touch and kinæsthetic sensation. It should be noted, however, that symbolism led to language otherwise than by the route of speech. The pupil developed speech after she had learned language. More than that, the teacher and her successors neglected no part of the structure of normal personality, as we have studied it. Altogether, it was perhaps the best piece of *positive systematic instruction* of which there is any record, and it can stand as a pattern of the groundwork of all systematic instruction.¹ If the teacher of one of a pair of identical twins were as well educated in systematic procedure as Miss Sullivan, while the other fell into the hands of a poor teacher or none at all, it is reasonable to suppose that the difference between the twins would come to be far greater than would be likely to be produced by differences in casual environmental influence alone.

The essential point in the case which concerns us is the emphatic contrast it reveals between systematic instruction and the casual influence of the environment in the education of the individual. Nobody can reasonably contend that the mere influence of an excellent home, however potent that influence may be in the cases of

¹ Helen Keller, *Story of My Life*, especially Miss Sullivan's case notes.

children who possess normal and healthy organisms, would have operated otherwise than it had operated in the five years which intervened between the destruction of the sense organs and the beginning of systematic instruction. Helen was educable, but not educable apart from systematic instruction; despite disastrous injuries to the organism, systematic instruction throughout childhood and youth yielded a personality far above that attained by the general run of humanity.

This view of the situation is commonly met with the rejoinder, "Oh, yes, but if Helen had not possessed a superior brain, her teacher could have done nothing." It might equally well be asserted that, if the child had been dead, nothing could have been done. It is true that if she had been what is commonly called feeble-minded, education would have been blocked. If she had been equipped with a phlegmatic temperament or low vitality, the task would have been more difficult. Miss Keller's subsequent eminence makes it easy to argue that she possessed a superior nature, which, being unlocked, in due season came to its own. But this is to manufacture facts to fit a theory. We can leave the "superior brain" to one side as part of a venerable mythology, and assert that to hold that her organism in general was anything more than a normal and, apart from deprivation of sense organs, an healthy organism is pure conjecture. Understanding the organism as we do, we can willingly concede that temperamental advantages probably made instruction easier and in the end led to interests in the pursuit of which she achieved eminence. Nevertheless, her eminence does not concern us; the attainment of sane, adjusted personality, a noble and cultured character, does concern us.

The concept of mental age

Touching the question of educability, the system of ideas which has grown up about the concept of mental age has seemingly been fruitful of a great deal of bad reasoning.

Now, if *mental age* is taken as being strictly synonymous with *personal age*, in accordance with usage relating to the connotation of "mind" commonly found in non-scientific literature, then the pathway of reasoning about educability is clear, for in that sense mental age means only the extent to which education has progressed in terms of expectations for chronological age. That is to say, if children could be held normally to attain a certain personal structure, by the time they are nine years of age for example, then children possessing that structure would be mentally nine years of age irrespective of chronological age. No question of the quality of the organism would be involved. What would be meant would be that the children had learned, in the sense of personal accretions, as much as the average child had learned by the age of nine.

But, as we have seen,¹ that is not the meaning which is attached to mind or to mental age in scientific writings. Therein, mind is taken as an aspect of the adaptive organism, the name for a collection of observable adaptive processes, to which is attached the name "mental." Hence, in the same writings mental age must be taken to refer to a stage in the growth or ripening of the organism. In fact, that is the meaning employed, and a large body of scientific investigation has rested on the assumption that there is a process of mental growth strictly similar to the growth of the body in stature, musculature and what not. Indeed, resting on intelligence tests and

¹ See page 229 and 234.

assuming them to be measures of organic capacity, a striking parallel is shown between growth in capacity and sundry measures of physical growth. We have seen at length the fallacies involved in taking the intelligence tests, or any similar test as yet devised, as measures of organic capacity.

Analysis. In order to demonstrate the reality of the concept of mental organic growth, we should be obliged to particularize and show that there is such growth in the processes by which alone we recognize mind. We must show that sensation and perception as such increase in acuteness up to the point at which the curve of organic development flattens out in physical maturity; that memory as a process as distinguished from content in memory behaves similarly; that imagination, apart from content on which it may work, becomes more and more prolific; that attention, apart from volitional control and expansion of interests, becomes broader in span; that judgment, apart from logical accretions in volition, language and symbolism in general, becomes more reliable. But these things never have been shown. On the contrary, so far as the lower processes are concerned, there is much reason to suppose that after infancy is complete, sensation, perception and imagination are as acute as they ever will be. Indeed, it sometimes seems that they are more acute. From the ontogenetic standpoint, that is what we should expect, for the child has more need of them than does the adult. As we have seen, the fact that as senescence comes on it is the childhood content in memory that survives longest would seem to argue that memory as a mental process is acute in childhood. Perhaps the psychiatrist's "buried memories" of childhood point in the same direction, although a better way to

look at this particular set of phenomena is to hold that these "buried memories" are in fact perverse accretions to personality. The case for attention and judgment is less clear; suffice it to say that the effect of learning has never been segregated and these are processes in which personal as distinguished from organic factors are singularly effective.

Cerebral relations. The concept of mental age parallels our rooted confidence in the brain as the "seat of the mind," our tendency to anthropomorphize the brain as the director of our destinies, and the age-old inclination to reason about the mind by muscular analogies.

Now in so far as the hemispheres, and particularly the cortex, perform the function of building up sensori-motor co-ordinations through which a large part, perhaps the whole, of our experience *is made possible*, and hence our learning, there is some antecedent presumption in favor of a theory of extended mental organic growth perhaps up into the early thirties. But the presumption does not become demonstrated until the neurologist is able to say just what the connection between the late ripening of functional activity in cortical fibers and the development of cortical layers on the one hand, and mental processes on the other really is. On that point, most of the neurologists are modest. Meantime, we are obliged to fall back on psychological methods proper, that is to say, the study of the phenomena of the mental processes themselves. To that we have already given heed.

Dependent on experience. On the other hand, there is abundant neurological evidence pointing to the conclusion that organization of sensori-motor brain integrations is dependent on experience. Two examples of such evidence can be cited.

The first is the result of the classical post-mortem examination of the brain of Laura Bridgman conducted by Donaldson, wherein it was disclosed that the cells in the areas associated with her sensory defects were palpably undeveloped. The inference is that lack of stimuli, and consequent lack of metabolic activity, in these areas had occasioned underdevelopment. But stimuli are experience.

The second is found in Kapper's principle of neuro-biotaxis, which is in substance that dendrites tend to grow toward stimuli and axones toward organs of motor discharge, thus organizing sensori-motor pathways. But again, stimuli are experience.

Consciousness. Nevertheless, we have found reason to believe that sensori-motor pathways in the brain are but one side of the function of the brain as an adaptive organ. The other, and at least equally important side, is in the metabolic character and mass of the brain as maintaining the condition under which consciousness exists, and consciousness is the theater upon which mental processes, and psychical processes in general, perform. Now it has long been noted that the child's brain, in both volume and weight, bears a much larger proportion to bodily mass than does that of the adult. Furthermore, by the age of 6 or 7 the weight of the child's brain is on the average well within the range found in the weights of brains in eminent men.

Altogether then there is small ground for basing a theory of mental age on the physical growth of the brain. The brain seems from an early age adequate to maintain consciousness and adequate to take care of the normal and healthful sensori-motor experiences of childhood. Abnormal and unwholesome emotional experiences are

another matter, but they are apparently a matter of unhealthy glandular activity, disturbance of general bodily health and the production of maladaptations in personality.

Intelligence quotient. The best factual evidence in support of the reality of the notion of mental age is found in the numerous critical studies based on intelligence testing which show striking parallelism, when large numbers are taken, to the advance of chronological age; and, further, studies in individuals which show an approximately linear improvement as the child grows older.

The studies are convincing, provided it is first granted that the tests are in fact measures of mentality as an organic function. We have seen that any such assumption is based on fallacious reasoning. Furthermore, two sets of facts stand in the way and lead us to a very different interpretation.

The famous case of the English canal-boat children will serve as an example of the first set.¹

These children were growing up without schooling, as an incident of the parental occupation. They tended to test out according to normal expectations up to about six years. Beyond that point they fell behind. Now there are two possible explanations. On the one hand, their mental organisms ceased developing at the age mentioned, but of this we have no direct evidence whatever. Or the casual influence of the limited environment in which they lived was sufficient to furnish experience out of which normal personal development could accrue up to the point at which they had exhausted environmental resources. Beyond that, they required contact with the cultural environment which can be found in

¹ See Bagley, *Determinism in Education*, 140.

normal community life, even apart from schooling. Of the two explanations, the latter is the more reasonable, because it rests on ascertained fact whereas the former rests on an assumption alone. But we need not stop with reasonable inference from a single set of facts, for we have a contrasting situation in the testing of children of American mountaineers.

At a secondary school in Tennessee, pupils were derived largely from remote and secluded sections in the mountains of that region. On admission, they were subjected to standard intelligence tests and their scores ran consistently low, in many cases falling within the range ordinarily imputed to definite feeble-mindedness. They were, however, admitted and followed the routine of school life and the curriculum. Retested after a year or more of school life, their scores came up to the normal expectation.¹ Here again are two possible explanations. It may be held, and sometimes is held, that school experience caused a rapid organic development. Or it may be inferred that the organisms of the pupils were sound and that an experience in a cultural environment resulted in rapid personal development. In other words, the pupils had taken on the learnings which the test had been designed to measure.

Again, the first of the two explanations rests on an assumption which is not only unverified, but is contrary to all we know about the organism itself. So far as physiological evidence has been accumulated, it all goes to show that in so far as experience has any effect on the physical organism the effects are confined to sensori-motor and affective experience proper. So far as we

¹ John A. Nietz, "What Does the Terman Group Test of Mental Ability Measure?" in *School of Education Journal*, University of Pittsburgh, January-February, 1928.

know, experience has no effect on the mental processes themselves, but rather enriches the perceptual range in appercepts and accumulates product in the memory system, in a word, ideational background.¹

The second of the two explanations rests directly on observed fact and is consonant with what we know about the organism itself.

The two sets of facts, that derived from the tests of canal-boat children and that derived from the mountain pupils, support each other and lead irresistibly to the conclusion that personal development and not organic mental development was the heart of the matter. The canal-boat children rested at age six, because there were no cultural resources from which they could learn. If they had been secured and subjected to influences such as those afforded by the Tennessee school, we must infer that similar results would have accrued.

The conclusions are well-nigh fatal to the doctrine of mental age unless the literary and non-scientific meaning of mind is employed. But in that case, mind ceases to be an organic concept and becomes personal.²

Correlation with physical indices. The case for mental age based on comparison of scores derived from intelligence tests with chronological age is plausible, until it is subjected to analysis. A less plausible case comes from comparisons of intelligence-test scores with indices of physical growth, such as increase in stature, progress of dentition, ossification of the hand and wrist, maturity in sex function.

In general, there is a parallelism between improvement in intelligence scores and indices of bodily growth, but

¹ See above, and Chapters V and VI.

² For collection of evidence bearing on the issue noted, see Bagley, *Determinism in Education*, chapter VII.

there are discrepancies. After all, when we use a measure of intelligence which has been standardized over against success in school, we are likely to get strikingly harmonious results in comparative studies, because in the end we are comparing effect of schooling with effect of schooling or the lack of it. Not so when we use some measure like progress in ossification, for there one term in the comparison is positive and unrelated to success in school, save as success is shown to depend on progress in physical growth. Naturally there are discrepancies; in general, however, there is parallelism.

Now, if we put the results of the studies of identical twins and the conclusions derived from the two sets of facts which we have been studying above into the picture with the parallelism between test scores and physical-growth indices, it is hard to resist the conclusion that alleged mental, organic, growth tends to follow physical growth merely because the child is getting older, is accumulating experience, and is subject to the casual influence of environment. In other words, growth is personal and not mental. If a single individual be subjected to either unusually good bringing up or else to unusually systematic instruction, he at once escapes from the correlation. So does a child who is deprived of normal environmental influence. We are not told that either the canal-boat children or the mountain children exhibited arrest in the progress of anatomical or physiological development.

The foregoing, is, however, subject to the qualification that slow physical *development* may, in the cases of individuals, be due to causes which also *impair* adaptive capacity.¹

¹ For rather convincing implications touching the breakdown of the doctrine of mental age, see H. H. Goddard, "Who is a Moron?" in *Scientific Monthly* for January, 1927.

"Learning age." On the other hand, there is some evidence which tends to suggest that learning capacity, as we use the term in our study, is influenced by physiological development, particularly in the sex glands. Such development would no doubt be influential on appetite and by that route on learning capacity. The evidence is however scanty and far from clear. Be that as it may, it is far more in accord with what we know of the organism and its functioning in general than is the notion of mental age and mental development.

Nevertheless, most of the evidence touching mental development and increasing learning capacity is washed out by pedagogical evidence which tends to show that even very young school children exhibit surprising capacity for book-learning when instructional conditions are made right.

Misconception of nature of organism. Altogether, the concept of mental development and mental age, which is its correlate rests on a false understanding of the nature of the organism in its adaptive functions. As we have abundantly seen, the organism is an instrument and not an outcome of the use of an instrument. It is a collection of processes in adjustment and not a product in adjustment. The concept of mental age rests on the assumption that there is organic growth and that learning, that is to say personal development, is strictly related to organic growth. But this is only preformistic biology and the unfoldment theory which so fascinated the pre-Revolution French philosophers and their followers.¹

The fallacy can be seen by anybody who will observe a pupil in a good primary school learning to read. Under favorable conditions, a year suffices and the child is at

¹ See page 349.

once launched on a career of progress in other learnings and personal development which bears no relation to progress in mental growth, if indeed there be much of the latter left to be achieved at the age of seven or eight. He bridges at a bound a gap which required many thousands of years of cultural evolution, and many millions of years of organic development in the race.

Having dealt at some length with what appears to be a series of fallacies upon which arguments touching the educability of the individual have often been based, we ought now to turn to a more positive inquiry as to what has been made out of the matter of organic capacity, premising the statement that science is still far from its last word.

II

First of all, let us recall the more obvious defects in the organism.

Sensory defects

We are all familiar with the cases of children who are afflicted with impaired vision or hearing. Here are true organic defects which stand in the way of complete access to experience and hence in the way of the learnings which arise out of experience. They are of course particularly obstructive to the cultural learnings of the school, the basal experience of which is in books which have to be read and in word-of-mouth teaching which has to be heard. In the well-equipped school, such defects are identified early in the child's career; they ought to be so identified in all schools. In former days, pupils might and frequently did go far along in the school career, handicapped and even blocked in education, and the true cause of failure never detected.

But these defects are in large part *avoidable*; they are seldom *remediable*. Poor vision can be corrected by the use of glasses; the effects of poor hearing can be minimized either by seating the pupil in a favorable position or even by the use of audiphones.

Children unhappily may at times be found who are totally blind or completely deaf. But these can be taught and are taught by the use of systematic procedures which in spirit ought to be applied to all children.

So it cannot be argued that organic defects in vision and hearing stand in the way of educability. The fact that parents will not or cannot provide corrective devices and the further fact that the school either will not or cannot employ an appropriate instructional procedure do not in any way prove the contrary. That a thing is not done, or even never has been done, does not prove that it cannot be done.

It is quite true that the blind and the deaf will never be able readily to do all the things that normal people do, but that is no evidence against educability. A normal person may be thoroughly equipped to enjoy the art treasures of the Old World, much better equipped than many who can afford to see them, and yet never have been able to make the European tour. Inability to go abroad does not prove that he has no tastes.

But sight and hearing are not the only senses. Defects in other senses may exist, unavoidable and irremediable. In so far as they do exist, they are undoubtedly obstacles in the educational process, but they are seldom fatal and the proportion of cases in which they are serious is very, very small.

Very rarely — and doubtfully — lesions or malfunctioning in the cerebral sensori-motor pathways may prevent

the normal learning of certain arts, notably reading and perhaps singing. Evidence seems to show that systematic instruction can apparently open up equivalent pathways, especially where the block is critical as it is in the case of reading.

Motor defects

Similarly, we know of motor defects due to lesions, imperfections, or functional disorders of the nervous system. Some of them are medically remediable, and others are not, at least in the present state of science.

Failure of speech is such a defect, although most cases of dumbness are supposed to be due to the sensory defect of deafness. The child does not learn to speak because he cannot hear himself and others talk. Not learning to speak, he does not learn language.

But cases of motor dumbness yield to systematic instruction, either by building up the motor speech connections in the other hemisphere or else by teaching improvised sign language.

Paralytic children are undoubtedly blocked in many adaptive responses, and the problem of upbringing and instruction is rendered exceedingly difficult by reason of the fact that the child cannot get the normal experiences which arise out of child activity. Nevertheless, it does not follow that the development of personality is therefore rendered impossible.

Nutritional disorder

Failure in replenishing the organism with the resources upon which vitality depends is so familiar an instance of impairment of learning capacity that it scarcely needs more than recording. Thanks to the competency and vigor of medical people, social workers, journalists, and

teachers, elementary nutritional intelligence has fairly been bred into the mores. Failure in nutrition and malnutrition are organic defects.

Failure in nutrition is remedied by dietary control. Malnutrition means that for some reason the physiological processes are unable to digest or assimilate, or both, the necessary replenishment of tissue and energy. Medical science has made great progress in dealing with this problem and all but a few cases are *remediable* under medical treatment. The fact that a great many cases are not in fact remedied is no proof that they are irremediable.

Altogether then it cannot be held that malnutrition or inadequate nutrition are in principle blocks to educability, save in rare instances.

General health

All of us have days when we are not "up to par." We cannot seem to do anything right and still less to make plans or learn anything. Circulation is perhaps poor, or the bodily reserves are lowered, or the system is clogged with poisons — anyhow something is wrong. Such conditions are ordinarily temporary; they may be, in children as in us, chronic. Ill health is organic or at least a condition of the adaptive organism. So long as it lasts, it hinders the educational process and may block it altogether.

But most patients are curable; the condition is *remediable*. Bad general health cannot in principle be held to be a fatal obstacle to educability, save in those instances in which curative treatment is impossible. Even so, adequate personality has frequently been built up, even in the presence of wretched ill health.

Temperamental peculiarities

We have seen the meaning and nature of organic temperament, physiological pattern.¹ We are all familiar with temperamental peculiarities in our friends and in ourselves. That temperament influences the educational process in the individual can hardly be doubted. That it is decisive of educability is another matter. In the end, temperament is far more influential in determining what *is likely* to be learned, since it more or less determines what experience an individual is likely to have, than in determining what *can* be learned. It creates problems in instruction—which thousands of parents and teachers have successfully met—rather than blocks the educational process proper. In all probability, its influence on adaptive response is far greater than on adaptive change, and in that way are we likely to be deceived by what is commonly worshiped as genius. Apparently it does contribute to educability in special lines and to that issue we shall presently turn in connection with *talent*.

General adaptive defect

For centuries, perhaps, common knowledge has identified individuals as being either "lacking" or "queer." It is only in recent times that science has come to distinguish between the two vernacular terms, to discriminate between those who have been lacking from birth or an early age and those who have become queer, between adaptive incapacity and development which has in some way gone wrong, between subnormality and abnormality, between defect and insanity.

Definitions. Sundry attempts have been made to define defect. For some time the definition written into

¹ See page 184.

the books by the Royal College of Physicians of London held sway. The defective individual was defined as "one who is capable of earning a living under favorable circumstances, but is incapable, from mental defect existing from birth, or from an early age (*a*) of competing on equal terms with his normal fellows; or (*b*) of managing himself and his affairs with ordinary prudence." The English statute of 1913 wrote into the law the following definition:

Persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they, by reason of such defectiveness, appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.¹

However useful such definitions may have been in the rough-and-ready sorting out of humanity, they have seldom been surpassed for inadequacy.

Note that both the original definition and its revised form as used in the statutes rest on mental defect, while the rest of the definition enumerates what were supposed to be the consequences of mental defect. Now we get nowhere, in our inquiries touching educability, unless mental defect as such is defined. Presumably the English authorities were expected to establish mental defect and then check up by observing behavioristic phenomena. We may properly be skeptical that such procedure was commonly followed. Rather, the tendency would be to note the imprudent and ne'er-do-wells and the school failures and to infer mental defect in that way, in other words to fall into some of the fallacies which we have studied in the preceding section.

¹ Taken from A. F. Tredgold, *Mental Deficiency*, 2d edition, 1914.

If we were to accept lack of capacity to manage one's affairs with ordinary prudence as a definition, then Thomas Jefferson and Daniel Webster would both at times have fallen under suspicion, and the English courts would have been under the necessity of committing Leigh Hunt and other literary men to custodial homes.

If we were to accept failure to receive proper benefit from the instruction in ordinary schools as a criterion, then Linnæus, Darwin, Harriet Martineau, Napoleon Bonaparte, William H. Seward, and even the great Newton, would have fallen under suspicion touching mental competency. Apparently several of them as a matter of fact did fall under the suspicion of their teachers.¹

¹ See enumeration of instances in E. J. Swift, *Mind in the Making*, chapter 1. See also article previously noted, H. H. Goddard, "Who is a Moron?" in *Scientific Monthly* for January, 1927.

Dr. Goddard, one of our leading American authorities on the subject, calls attention to successful attempts at applying instruction to individuals who had been committed to homes for the feeble-minded with the outcome that these individuals did become educated to the extent of living useful lives and managing their own affairs with ordinary prudence. He concludes with the statement that "*Finally they can never be trained to exercise judgment in critical situations*;" (*italics quoted*).

These persons were committed on the ground, express or implied, that they could not profit from instruction, at least in the ordinary schools. But they did profit from instruction. If they could not profit from instruction in the ordinary schools and did profit elsewhere, then something must have been wrong with the ordinary schools.

The final quotation suggests the rejoinder, "But it was said that they could not be trained at all. How do we know that ten years hence you will not have to write another article conceding that they can be trained to exercise judgment in critical situations?" The argument is empirical and not rational.

But in principle nobody is ever trained to exercise judgment in critical situations. Some people become through learning the kind of persons who possess the bases upon which critical judgment *can* be exercised and who have through discipline become the kind of persons who *will* think accurately. If an individual is organically incapable of rudimentary common sense, as shown by competent laboratory tests, as some are, then he cannot become the kind of person who will exercise judgment at all.

The inference is that the people who did on Goddard's showing yield to instruction were never feeble-minded, or else that what they learned was simply

Now it would be of little moment to call attention to the inadequacy of this method of defining general mental defect were it not for the fact that a great deal of American practice has followed the same general line of reasoning, that is to say inferring defect from some sort of behavior indices prior to defining defect as such and showing a positive connection between defect and the indices used. Such has commonly been the practice with the crude administration of intelligence tests. To establish mental defect entirely apart from the application of the tests and then find that defect is associated with a certain range of I.Q. is one thing; to infer that everybody who falls within that range is feeble-minded is quite another. The score in cases of mental deficiency is low because the subject is defective; he is not defective because the score is low.

The ease with which fundamental inferences can be drawn from intelligence tests, and yet be so lacking in critical value as to be diametrically wrong, is illustrated by the following piece of case work.

The subject is a boy of eleven who has never been in school. He has but a few words. Given the Binet test, he has little or no success. A tentative I.Q. is assigned which would place him as an idiot in the conventional scale. The case worker, however, attempts by sign communication to find out whether or not the ideas and acts represented by the test are present and finds that a good

a series of adaptive responses in stock sufficient to enable them to get by. The first alternative is on the showing to be preferred.

The long tale of man's inhumanity to man contains not a great many instances of grosser injustice than that of imputing organic inferiority on utterly insufficient evidence or no real evidence at all. The practice of allowing two practicing physicians to certify a case of feeble-mindedness, or a young staff officer in a school department who has had a few courses in psychology to do the equivalent, is little better than the complacency of barbarism.

many of them are, although the ideational background is of course very meager. His free behavior at home is not that which a low-grade defective would show. Continuing the examination, the subject is found to be partially paralyzed in right arm and leg.

There is a small stock of articulate words which constitute, so far as they go, a valid vocabulary, but there is no speech. There is a meager ideational background but no means of testing it by the verbal responses of the subject.

Now the history shows that the boy did learn to talk "at the usual age," which means that the family noted nothing peculiar in the infancy. He had then normal speech at one time. At about three years of age there was an attack of some neural disorder and thereafter speech fled. The evidence is clear then that there is more or less cerebral disturbance about the speech center and perhaps more extended malady of the left hemisphere.

The evidence is further clear that the case is one of motor aphasia existing from early in life and not general adaptive defect at all. Very possibly surgical diagnosis might show an operable growth of some sort.

The case is probably remediable, perhaps first by surgical interference and then by systematic instructional procedure, or by systematic procedure alone. Instruction would presumably be directed to bringing the homologous center in the right hemisphere into functional activity. The case in its nature is presumably remediable whereas it would be irremediable on the original inference from the Binet.

The notion of limited capacity not amounting to imbecility had a progenitor in the belief of Alfred Binet that a subject might have mentality enough to get along in the provinces but not in Paris. Of course the more economi-

cal explanation of the difference is that people who move from a simple into a complex environment may have a great deal to learn. Rather primitive personality may get along well enough in a somewhat primitive community and break down in one which requires either fully civilized personality or else the learning of the adaptive responses required for a complex environment.

It would be hard to find any community, however primitive, in which definitely defective persons could get on and lead self-dependent lives at all. Indeed, the farther back we go toward savagery the more remorseless must Nature have been in weeding out defective adaptive capacity. Under the protective influence of civilization, the defectives breed, survive, and attract our attention.

The whole body of argument, of which the foregoing are illustrations, evidently rests on the doctrine that adjustment in the individual is strictly proportionate to organic unfolding, that the organism is the seat of adjustment, whereas we have seen over and over again that the defensible view is that the organism is an instrument and that adjustment resides in the products of organic processes, that is to say in accumulating personality.

Uncertainty of behavioristic definitions. There is probably no entirely safe definition written in terms of behavior, for the reason that no positive relationship between defect and behavior can be made out. There is always the uncertainty which hangs about our inability in a given case to discriminate between what cannot be learned and what has not been learned. Two rather striking cases in our collection illustrate the point.

In the first, a boy of nineteen or thereabouts exhibited most of the characteristics of imbecility. In the neigh-

borhood he was accepted as the "town fool." On a standard intelligence test, his I.Q. was within the range commonly attributed to definite feeble-mindedness. Case study, however, led to the hypothesis that the pupil was an instance of infantilism traceable to systematic spoiling from babyhood. Removal from the family and local environment to a strong private school abundantly justified the hypothesis.

In another case, the pupil, eight years retarded in school, had been peremptorily identified as a middle-grade imbecile by a medical psychiatrist, presumably a competent man. All the behavioristic symptoms confirmed the diagnosis. Personally, the boy was a miserable tangle of perverted learnings, maladaptations, and lack of learnings, complicated by a serious physical defect. Case study led to the hypothesis that the original trouble was a perverted learning in reading; meaning had become conditioned to reading aloud. That is to say, the boy could indubitably read in the true sense, so long as he could hear himself read. In fact he responded successfully to rather severe tests. Working on that basis, the teacher in the course of a few months brought about a distinct improvement. The pupil gained confidence in himself not only in the schoolroom but on the playground. He revealed capacity to interpret a novel situation within the range of his experience.

Now in both the cases last cited, probably typical of many, the pupils presented the appearance of organic defect in the ordinary behavior expected of normal people, not because they could not but because they would not exhibit normality — the first, because he was volitionally a baby; the second, because self had become utterly abased.

Nature of general adaptive defect

Now within the category of defect, it has been customary to include different varieties comprehended in the main as levels. The profound idiot is taken as a sort of base line — no mentality at all. The less profound idiot has more mentality; the imbecile still more, the moron more yet; and so on up through the dull normals and the normals to "genius." Such a method of classification, as I trust we shall see, is misleading. Rather there are, apparently, all sorts of general mental defect complicated with other forms of psychical defect and all resting in the end on defective or malfunctioning physical adaptive organism.

Deformity. On the whole, those who are generally classified as idiots seem to be in one form or another monsters, either because physical development *in utero* or in infancy has gone wrong, or because they are reversions to type in the general primate stock, or else because they are mutants, instances of Nature's "fool experiments." Much as we may think the brain has been over-rated as an adaptive organ we should still scarcely expect to get normal unlearned behavior, and hence experience out of which personality can be built up, in individuals who are extremely microcephalic or in those whose neopalliums are so undeveloped that the cerebellum is not covered. In brief, these individuals do not learn because the machinery for experience-getting and for adequate adaptive response is not present. Now they may from birth have merely existed as living bodies, or they may exhibit considerable adaptive capacity, be possessed of speech for instance, depending on the character of the deformity. Be that as it may, *deformity* is present and is presumably the characteristic of the whole

group, extending well above what are ordinarily called idiots.

Functional disorder. On the other hand are the victims of functional defect. On the whole, the weight of the evidence points to the conclusion that these people have no critical deformity or lesion in the adaptive organism but are rather instances in which vitality is too low to maintain acute consciousness.⁷

(1) In the psychological clinic, the most significant disclosure is narrow attention span. They cannot keep things in mind very long or many of them. Hence, the characteristic behavioristic sign: they do not think out even the simplest situations. In school, they begin to manifest their incapacity when the study levels are reached.

(2) Even in normals, nutrition adequate to maintain the basal vital processes is essential to learning. Pupils who are dull and slow to learn are frequently speeded up by correction of dietary insufficiency. Pupils who have been bright and then lapse are brought back by similar treatment.

(3) Pupils become dull and clinical observation reveals lowering of basal metabolism, related to sluggish functioning of the thyroid gland. Medical treatment removes the deficiency and the pupil improves both clinically and in learning capacity. So far as we know, however, the medical treatment must be continued, at least at intervals.

(4) Cretins are often observationally idiots, but it has been shown that this condition also is traceable to malfunctioning thyroid and when found early enough and medically treated their condition is greatly improved.

⁷ See discussion of physiological foundation of consciousness, page 218.

(5) People who are positively identified as defective, on the basis of clinical and laboratory observation and tests rather than on behavioristic grounds, are characteristically shortlived.¹

In this discrimination between deformity in the organism and functional inadequacy, we must not be deceived by revelations of subnormal development in the cortical layers. Underdevelopment may very probably be due not to malfunctioning but to non-functioning as a consequence of meager sensori-motor and affective experience.²

Overlapping. In discussing defect founded on deformity and that founded on malfunctioning we are in reality dealing with two entirely different kinds of disorders, which are, nevertheless, much the same in outward effect and differ only in degree, so far as appearance is concerned. If we take cretins to be the lowest in adaptive capacity of the functionally defective, then the functionally defective considerably overlap the deformed, in observed characteristics. Thus is the notion of a graduated scale to cover them all misleading.

The point is chiefly important because a similar observational overlapping as between normals and subnormals is evident. We find it in the canal-boat children, in the mountaineers and very frequently in our pupils. Under testing procedure and in respect to school success, they are hardly to be distinguished from subnormals. Under competent and critical investigation in the psychological laboratory the distinction ought to be clear. Defect is personal and not organic. On the other hand, untrained

¹ See for instance M. W. Barr, *Types of Mental Defective*, 1920.

² See Donaldson's report noted on page 404.

For relations between sluggish mentality and glandular irregularities, see Hoskins, *The Tides of Life*, 1933.

observers who encounter the individuals who are known as *idiots savants* could with difficulty be convinced that they are not in the presence of genius of some sort.¹

The very existence of the type just mentioned ought to warn us off the concept "mental" defect. There may be, probably frequently is, organic defect, other than abnormality, based on deformity or malfunctioning of processes in the adaptive organism other than those comprehended by the term "mental."

Cause of functional defect

In view of the disclosures and argument which have thus been developed, we should antecedently expect functional defect proper to be a qualitative characteristic and not merely the lower end of a linear scale which runs from idiocy to marked superiority in adaptive capacity, in other words that it represents a taint and not merely inferiority.

The evidence on the whole supports the expectation.

Most of it seems to be hereditary in the family line and as such behaves as a Mendelian recessive. To be sure, more light on the mechanism of biological heredity has made students less confident of their ability to "write on the blackboard" the consequences of a given mating or the chance of transmission in the progeny of a given mating. But that in no wise explodes our belief in its hereditary characteristics or in the character of transmission where transmission actually occurs.² Some genetic taint interferes with capacity to maintain metabolism at the critical value, perhaps through failure in integration of

¹ See Tredgold's account of *The Genius of Earlswood Asylum*, and Barr's musical case in works previously cited.

² See Jennings, *Biological Foundations*.

the glandular organism, but the taint is unitary in character; you either have it or you do not. On the other hand, some of it seems to be traceable to chemical lack pure and simple. Such is apparently the case in regions in which cretinism is endemic and the evidence to date points to the lack of essential chemicals in the food and water supply.

True hereditary defect is undoubtedly beyond any conceivable systematic instruction. Whether it will ever be remediable by medical treatment we do not know; at all events, it is not remediable now.

But it is commonly held that toxic influences during gestation, destructive diseases after birth and mechanical injuries may cause the functional condition. Much of this belief is on a par with belief in the consequences of "being dropped on the head when a baby." The verdicts of family physicians who tell parents after an attack of scarlet fever, or meningitis or infantile paralysis or a nutritional disorder that they "wonder that the child has any mind at all" are doubtless responsible for a good deal of the prevalence of the notion. In one of our cases, this had happened and the parents had persuaded themselves, the child and his teachers, that such was the case. Critical case work disclosed that, albeit the pupil was partially paralyzed in the left arm and left leg, he was by no means adaptively subnormal. He responded to a new attitude on the part of parents and teachers and in due season graduated from high school with credit.

Nevertheless, alcoholism in the mother, or syphilis or some other toxic factor, may cause normal physical development to go wrong at a critical point, and doubtless malady in early infancy may do the same. Where these cases exist they are rather to be included under the cate-

gory of deformity than under that of hereditary defect proper. We still find in reputable treatises the contention that toxic influences such as those mentioned above may modify the germ plasm and fix the trait as an inheritable characteristic transmissible from generation to generation. Until biologists are willing to admit the possibility of genetic transmission of acquired traits, we may be skeptical in the presence of such assertions. Biological opinion is all but unanimous in the opposite direction.

III

EDUCABILITY IN THE MASS OF THE POPULATION

To return to the question raised in the introduction to this chapter, Who is educable in the sense of being able to take on the characteristics of fully civilized Man? And how many are educable?

Let us answer the second question first. We do not know directly, for any direct answer would involve census taking. We can, however, draw inferences from the answer to the first question which will serve our purposes.

To begin with, we must confine the issue to *educability* as depending upon the nature of the organism and exclude *instructional impracticability* traceable to economic and other social conditions, and to pedagogical ineptitude.

1. *Sensory and motor defects.* Certain individuals are uneducable, through instructional procedures suited to normals, by reason of sensory or motor defect or both. These defects are *avoidable* either by some form of medical corrective treatment (counting the fitting of optical or auditory appliances as medical treatment) or else by systematic instruction adapted to their circumstances.

We can rule out this whole group from the category of the uneducable.

2. *Organic pathology.* Certain individuals are similarly uneducable, due to pathological conditions of the physical organism and are not open to special procedures in systematic instruction. Nevertheless, they are *remediable* by medical treatment even where they are not, strictly speaking, curable. The number of such pathological cases which are medically irremediable is very, very small in proportion to the total population.

3. *Health.* Certain cases of chronic bodily ill-health occur in which educability is impaired rather than blocked. In such cases, the essence of the matter consists in the fact that upbringing and instruction are rendered more difficult. We cannot count them into a census of the uneducable.

4. *Nutrition.* A large number are either uneducable, or else in them educability is greatly impaired, by reason of insufficient nutrition, or improper diet.

In such cases, instruction may for the time be impracticable, but they are in no sense uneducable, for proper diet *can be* found and provided.

5. *Specific defects.* So far as we can make out, some children exhibit specific organic defects which do not warrant including them in the category of general defect, but which do block the acquisition of critical learnings, notably the primary school arts. But the number is very small. Founding our faith on what has been accomplished, we can reasonably conclude that, save in a negligible number of instances, such defects are either medically remediable, or avoidable, or else the pupils are subject to education by special applications of systematic instruction.

6. *Race.* But in the United States, and in the British Empire taken as a whole, the complication of racial differences enters and that is perhaps the most serious difficulty in finding the answer to our question. Racial prejudice is still very strong, fundamental cultural conflict is perhaps still stronger, and the ways of sentimentalists and ultra-liberals further complicate a situation which without their intervention is still sufficiently complex. We cannot hope to settle the question on positive grounds, but we can still consider the evidence and in some degree straighten out our thinking.

A large part of the thinking which has been devoted to the problem, to the disadvantage of inferior races, has run into the fallacies which we have noted in the early part of the present chapter. The burden of proof has been shifted to the shoulders of those who would maintain educability, of the colored races especially. Arguments are held to be conclusive proceeding from the superior attainments of the white race and of the Nordic element in the white race particularly. The home as a factor in cultural transmission has been ignored in favor of the family as a factor in genetic transmission. The influence of unfavorable environment and of lack of good schools or any schools at all has been similarly ignored, forgetful of the fact that similar factors are shown to result in personal development in whites arrested at a childish level.

Argument from superior civilization. Perhaps the most compelling argument is in the contention that the white race has surpassed all others in building the structure of a civilized society. If these others could do so, why did they not, if they had the capacity?

Now the one outstanding characteristic of the human

species which holds the world today is in the fact that its progress has been almost entirely cultural and not organic.

Geographic, archæological, and historical researches have made it fairly clear that the civilization achieved by the peoples of the Western world is traceable to the fact that in the Nile Valley there grew up an early civilization, national in scope, in the only spot on the globe in which such a thing was possible. The foundations of our fabric were being worked out in protected isolation during a period of perhaps three thousand years or above, before more than the rude beginnings of civilized States appeared elsewhere in the West, a period nearly if not quite as long as that which has elapsed between the Siege of Troy and the present time.¹ The culture in which the foundations of civilization were embedded spread about the shores of the Mediterranean, was lost to Europe during several centuries, recovered in the Middle Ages, and has since spread pretty much where the white race has gone. One reason, at least, why the black and brown races never built anything of the sort resides in the fact that they never lived where it could be done. It could be done, but not so well, in the Tigro-Euphrates Valley and in the valleys of the Indian and Chinese rivers, and it was done.

We have no reason whatever to believe that the ancient Egyptians were superior stock. They were certainly not Nordics. What we do know is that they lived in an environment in which we could antecedently expect that organized society on a large scale would develop, and after the facts we know that it did develop. We know that under less favorable, but still favorable, conditions it did develop in part elsewhere, with no clear evidence of cultural transmission from Egyptian sources. The

¹ See James H. Breasted, *The Dawn of Conscience*, 1933.

Hebrews, the Greeks, the Romans, and the European nations, on the other hand, do show clear evidence of cultural inheritance from Egypt and to some extent from western Asia. In other words, they inherited capital upon which to build and they built. They enriched our body of culture and here and there made their own contributions to the fabric of civilization itself. But when we find evidences of the heart of Magna Carta and of our own Bill of Rights in an Egyptian royal address to government officials dating from 2000 or more B.C., we tend to lose confidence in the exclusive merits of modernity.

But there must have been some sort of superiority in the peoples who took on civilization already in existence. Without arguing the case for all the nations which have arisen in the last two thousand years, we may take three illustrations from the white, the yellow and the brown races.

Those of us who are of Anglo-Saxon stock take a just pride in our heritage. Our ancestors have drunk deep from the stream of civilization and few can successfully dispute that we have contributed more largely than any other modern cultural race both to the fabric of civilization and to the spread of civilization. But it is a commonplace of history to note that the Island of Great Britain possessed some of the essential geographic conditions of the Nile Valley. It is in the temperate zone and it is protected by geographic barriers. For eight hundred years prior to the first swarming, there had been time for the accumulation of social experience in a consolidated State, interrupted but once and then but temporarily. Our race is genetically a mongrel, containing elements of pretty much all the stocks that have appeared in Europe, since neolithic times at the least. We can scarcely claim that our civilization is in the blood.

Japanese capacity to absorb civilization and convert it into the structure of their life is too manifest to require comment. They live in a group of islands in the north temperate zone and had progressed far in civilization before the rapid absorption of Western culture began.

The Maoris live on a group of islands in the south temperate zone. Prior to the coming of the whites, social experience had led them a long way upward from the life of the primitive man found across the way in Australia, a zoölogical and cultural kingdom apart, the most inhospitable of all the continents. But the Maoris, since the colonization of New Zealand, have shown marked capacity for taking on civilization despite the inevitable race conflicts.¹

The blacks on the other hand, both in the tropics and below the tropics, lived under geographical conditions which were the least favorable to the development of organized society, save those found in South America and Australia. Furthermore, they lived in practical isolation from the flow of cultural contacts from remote pre-history down to recent times, and then their contacts were largely those of brutal exploitation. Even so they did something.² In very recent times, under the influence of English schools, they seem to be making rapid progress in the home land in taking on the bases of civilization.

Per contra, it must be noted, life in the tropics exercises a malign organic influence. Indolence is rewarded and exertion is penalized. Whether or not such environmental influences acting over many centuries would exercise so unfavorable a selective influence on the adaptive organism as to throw it below the critical values we

¹ See J. B. Condliffe, *New Zealand in the Making*, 1930.

² See Paul Radin, *Social Anthropology*, 1932.

do not know. It might. It is more likely that it would operate to produce a larger proportion of subnormals than to produce an inferior race.

The reds remain. The pre-history of the American Indian is still shrouded in obscurity, but we know at least that where geographic conditions were right, as they were in the Peruvian highlands, Central America, and ancient Mexico, he made substantial progress in the pathway of civilization. Under other less favorable but still somewhat favorable conditions, as was the case with the Cherokees in their native habitat and the Iroquois in New York, he made considerable progress. The Cherokees are said to have been of the Iroquoian linguistic stock, but so were the Hurons living in the country to the east of Georgian Bay. Life among the latter was apparently one long nightmare, if we may trust the Jesuit Relations, the only source we have.

The argument might be carried to greater length, but the foregoing will suffice. Altogether, there is scant evidence on anthropological grounds that organic differences between the different varieties of *homo sapiens* as races can account for the immense differences in culture and progress in civilization which we find.]

The evidence from psychological tests, especially as between the whites and blacks in the United States, is not favorable to the blacks. But, we must note, no psychological test yet devised can with certainty exclude personal factors. Even so, the army tests during the recent war showed a distinct difference between the negroes in southern and in northern cantonments in favor of the latter.¹

¹ See, for instance, F. N. Freeman, *Mental Tests*. For a brief summary of the evidence for genetically based adaptive differences between the races, see C. B. Davenport in *Science*, N.S. 68: 625, 1928. See W. D. Wallis, "Race and Culture," in *Scientific Monthly* for October, 1926.

In the whole matter of comparative organic adaptive capacity as between the races, we must then assert that until the contrary is shown, there is no good ground for the doctrine of racial inferiority as such. Nevertheless, this is not to say that all subraces would similarly so classify. There are various instances, such for example as the pygmies, who seem to be so different in structural aspect at least, and probably in physiological constitution, that the *a priori* case is not so good. Even in the most highly civilized white nations we are familiar with backwaters in which the population is in fact organically inferior.

But whether we compare the different primary races, or the different ethnic stocks within the white race, it must be remembered that not only culpable prejudice but the more reasonable and legitimate conflict between different cultural levels, leads inevitably to personal perversions and maladaptations in the more backward stock or in an ethnic group which is more or less in subjection.¹ Nature commonly balances the equation by lowering the higher cultural level. So it apparently was in Rome from the Punic Wars onward. So it probably is in modern United States.

7. *General adaptive defectives.* Whether subnormality originates in developmental deformity or hereditary taint, the subnormals are definitely uneducable, so far as we at present know. Instruction is hopeless, at least to the full level of general education, for instruction cannot operate in the presence of general adaptive deficiency. Whatever improvement in the lot of these people there may sometime come to be, it can come only through the advance of medical science. Whatever hope there may be in reducing

¹ See Chapter IX on adaptive changes in inferiority situations.

the number present in society, hope must rest: first, on improvement in the care of mothers during gestation and child-birth and in the care of infants; on civil control of pernicious influence; and on the spread of eugenic ethics.

The percentage of subnormals in the population is apparently altogether the largest single element in the percentage of uneducables. In our earlier enthusiasm for feeble-mindedness, responsible conjectures as to the percentage in the general population seldom exceeded two per cent. More conservative estimates based on more critical studies have tended to reduce rather than to increase the proportion. Tredgold in the fifth edition of his work reports a census of 314,000 aments of all ages and grades in England and Wales in 1926. This would amount to about eight per thousand of general population, distinctly less than one per cent. American estimates run decidedly lower.

The sum of the matter

Altogether, then, the proportion of uneducables in the population is very small, particularly when we realize that instruction can summon to its aid the resources of medical science, either to avoid the consequences of organic defect or else to remove the defect itself. In all probability it is well within two per cent, at least in Continental United States.

We thus arrive at something like a base line and exclude the very great proportion which has never yet become educated from the domain of hopeless natural impediment or obstacle. We transfer the issue from nature to art founded on scientific insight and systematic procedure. If a very large percentage of the population is still uneducated in the sense of not having become

adjusted to the world in which they live, in the sense of having failed to take on the civilization which is the product of many thousands of years of social experience, then the failure in the last analysis is the failure of the State to provide the means of applying through public instruction the schools which can and will utilize the resources of science to achieve what might be achieved.

IV

SUPERIORITY

We have still left unanswered the matter of superior adaptive capacity in people who are organically normal and sound — the talented, “the aristocracy of brains.”

We are exceedingly hospitable to the notion, and our hospitality at bottom rests on self-appetite. Those of us who have been successful in the struggle for existence, or think we have, get a deal of perverted satisfaction in thinking that we are of superior clay, the more so perhaps in proportion as we have never actually struggled but have received our success as a free gift from some ancestor who did struggle or from the benevolence of a paternalistic State.

Very little of the evidence from which we infer the reality of superior capacity has escaped the fallacies which have surrounded the findings for inferiority. We must get outside the vicious circle of reasoning from success to capacity and then back to success again.

Rapidity in learning vs. learning itself. As we study pupils in the schoolroom, we can hardly escape the conclusion that some of them learn readily and others but slowly and we jump to the conclusion that the differences are inherent. The observed differences are far from conclusive on the point at issue.

Assuming for the moment that the slow learner is perfectly normal and healthy, it is still true that every pupil has a personal history. Under casual upbringing at home and casual instruction in the school, one may have escaped the pitfalls of perverted attitudes and the other have fallen into some of them. This one may have sloughed off the negativism of infancy and become docile, that is, teachable; and the other may have still in his personal fabric a residue of the balkiness of healthy babyhood. This one may have learned to read and the other have lingered at the deciphering stage. One may have learned early to apply himself and the other not. These things and a great many others like them are almost never checked by the instructional staff. Indeed, I have known at least two cases in which pupils survived, one of them to the seventh grade and the other to the twelfth, ridiculously mistaken about the processes of addition and multiplication respectively; and yet no teacher had ever noted the fact and applied the simple correction required. Both had been in school systems which would rate as first class. Now these are illustrations of failures in the structural elements of personality themselves.

A part of the personal history is found in the cultural background which the pupil brings to school with him. We have several times noted its significance. From the beginning, this one has never encountered a piece of school-room experience which did not assimilate itself readily to past learnings. The other has rarely found a piece of teaching which would register, and has been obliged to build laboriously from the foundations.

Our whole traditional school structure creates a spread in the observed rate of learning which is artificial. This pupil barely passes the requirements of a given grade;

this one barely fails to pass. Nevertheless, they are thereafter six months or a year apart in the rate at which they pass through school.

Altogether then, differences in rate of learning as observed are much more attributable to quality of previous learnings, to the character of personality which has been built up to date and sometimes to the artifices of the school itself, than to actual organic differences in learning capacity.

The dull pupil. Nevertheless, reasoning, not from observed differences in the school career, but from what we know of the adaptive organism, we should expect that relative sluggishness in learning capacity might be a reality, even when there is no taint or deformity in the organism which produces the qualitative difference which we call subnormality. Indeed we do know that people differ materially in the energy with which the whole complex of the glandular system drives them and so it may be in the intensity of consciousness. That, however, is pure conjecture. What is more than conjecture is the principle that energetic people can get more experience, out of which to learn, in the unit of time than can others.

Hence, however carefully we may guard ourselves against mistaking experience for the capacity to get experience, it still remains true that we must admit the reality of actual organic dullness at the level of normality.

But it does not follow that dullness, other things being equal, is necessarily an obstacle to complete educability. In other words it does not follow that there is any reality to the concept of levels of educability in the normal. The individual is not a vessel of predetermined volumetric capacity.

What does follow is that maturity may be deferred longer in some than in others just because learnings come slowly. Nevertheless, though one child may learn to read in a year and another may require three years, reading is reading, as much in one case as in the other, and it has the same personal value. And so on up through the great structural learnings. But we must not forget that other things are almost never equal and that actual dullness cannot be identified save by the methods of laboratory testing.

Talent

The race has always worshiped talent, even back to the time when our primitive ancestors could see no difference between that and the vagaries of insanity. While we have made some progress, it is still true that artists can usually succeed in attracting a following merely through the device of eccentric behavior. Even scientific men are not invariably exempt from the failing.

We cannot, however, doubt the reality of talent or of its organic foundations, nor need we become greatly concerned about it in the field of general education. It is more important to see what it is and its relationship to the concept of organic superiority.

Actual talent, apart from the spurious article founded on the cultivation of eccentricities for the delusion of the public, is probably always an implication of special organic traits. We scarcely ever in reality think of talent apart from one or another of the arts in which sensori-motor sensitivity is at the heart of the matter — better than ordinary sight or hearing or touch — or else some peculiar physical character like the great oral cavity of the singer or old-time orator. Such people can learn

better than the general run in special fields because they can get experience that others cannot get. They can respond in productive activity because they have the instruments for the purpose.

But it does not follow that they are superior in capacity for general education. On the contrary, talent is likely to lead to preoccupation in the special field and unbalanced personality. It is the age-old story of the penalties of specialization; progress is along the trunk lines. While talented people can contribute heavily to the cultural capital of the race, they do so only on the basis of general education, of personality which is strong in its central axis of control, in its volitional and thought structure. The really great creative artists who have produced what lasts and has valuable social import have nearly all been men who in one way or another have drunk deep in the accumulations of culture. Most so-called talented people are merely examples of experiments which failed.

It follows that when a pupil turns up whom we believe to be talented we mislead ourselves if we think we have found a superior pupil. On the contrary, we are more than likely to have found merely a problem case.

Aggressive temperament and capacity

Closely related, are the "world-shakers," "empire-builders," "captains of industry," and the like. We contemplate these people with admiration, think back to their school days and wonder what they were like. Must have been superior. We forget that what we are watching is adaptive response, founded perhaps on mere muscularity and more often than not on unsublimated self-appetite. It does not follow that they are or ever

were of superior educability. On the contrary, we are periodically saddened and disillusioned by revelations of baseness and cruel exploitation — disillusioned until next time. But this is not to say that all such are base. On the contrary, many of them, probably most of them, are persons of superior character, intelligence and taste; but their quality as civilized personalities is no different from the quality of other and less aggressive individuals as civilized humans. Once educated, their temperaments and energies make them invaluable members of society.

Altogether then, there is little reason to believe either in levels of educational possibilities founded on organic qualities or in any great range in the rate at which education can be taken on. The acquisition of the great fundamental cultural learnings gives advantages which completely overshadow such differences in organic adaptive capacity as there undoubtedly are, provided we exclude from our reckoning positive deformity or taint in the organism itself.

Breeding the superman

Remarkable achievements in breeding animals and plants, and even more remarkable achievements in disclosing and formulating the laws which govern heredity in the germ plasm, have fascinated people with the possibility of breeding a superior race of men.

The notion very evidently rests on a misunderstanding of the nature of Man and his place in the Universe as science understands both terms.

In our study of the principles of education, we have dwelt, perhaps more than on any other issue, on the distinction between the organism and the outcome of the organic processes in personality. We have especially

explained the fallacy of supposing that adjustment inheres in the organism, so that a better organism might itself constitute adjustment. But the eugenists who rest their faith on human stock-breeding and who would either adjourn or expand ethical considerations in the interest of their plans are in reality resting their case on a biology which long ago was disproved.

Suppose, on the other hand, that Superman meant merely a better, more powerful and better integrated physical organism, and that is all it could mean, it would still be true that superior Man must learn and all there would be for him to learn is what the race has learned. He might learn more rapidly and come to maturity earlier, and perhaps more of the race would succeed in coming to maturity.

On this last clause hangs the position of sober, scientific, practicable eugenics, namely the reduction of the number of tainted stocks in the population.

The human stock-breeders fall into a difficulty which is not uncommon among those who aspire to a better world produced on a short order. They ignore definitions. Breeders are obliged to contemplate objectives. If one desires a better rose, superiority is defined as more attractive fragrance, more blooms, hardier stock. But who is similarly to define human superiority? Man himself is defined by his evolution from the lower orders. If we could imagine a thinker amongst the higher apes, and if the other apes would have allowed him to conduct breeding experiments, he could never have produced Man, for he would never have had any experience of Man. He would infallibly have made a mess of things.

It is equally true that no man or woman can possibly cut loose from the stream of civilization and determine

a priori what the youth of the race should learn. When such people embark on such an enterprise, they too make a mess of things, save in the event of the exceedingly rare chance hit. Adjustment is defined by social evolution even as Man is defined by organic evolution.

The hope of the world for escape from the evils which try mankind cannot be along the pathway of something better than *homo sapiens*; hope is bright along the pathway of an instructional system which in the end will make all normal men and women as civilized as the most fully civilized are today. What lies beyond that we do not know. Whatever it is, we can be sure that it can be nothing else than a better civilization growing along the trunk line out of the art of living which already exists.

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